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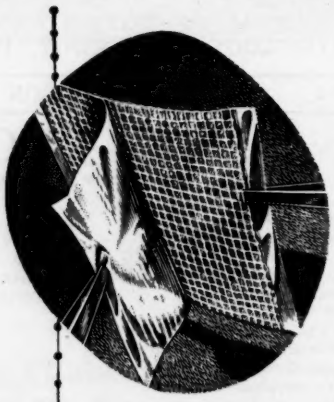

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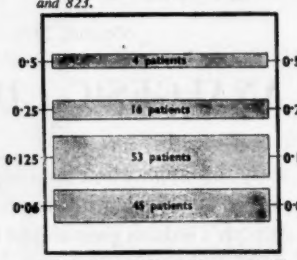

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(1). The Dental Practitioner. Aug. 1953, p. 376.
(2). B.M.J., 13th Feb., 1954, p. 393.

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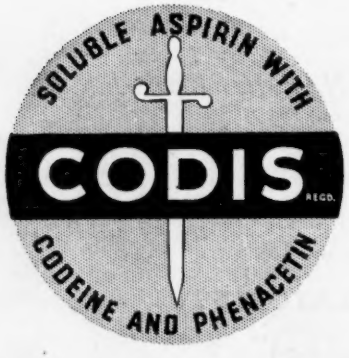

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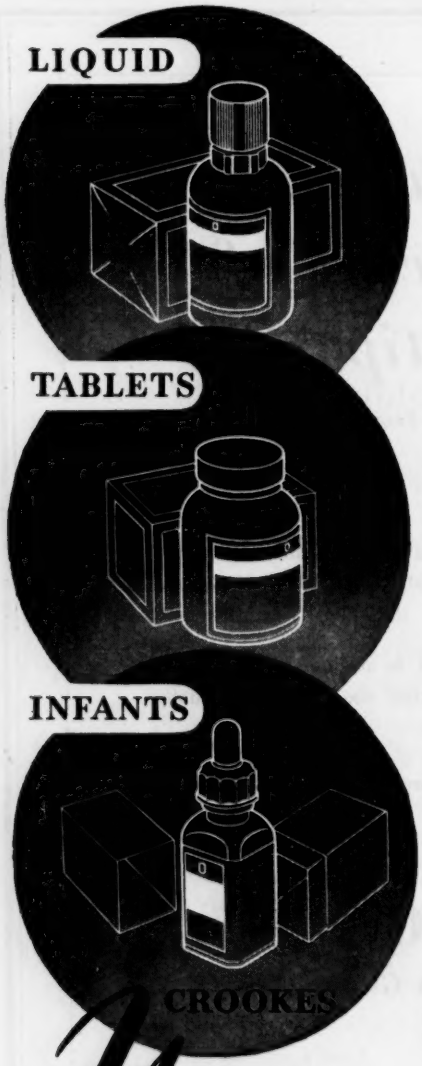

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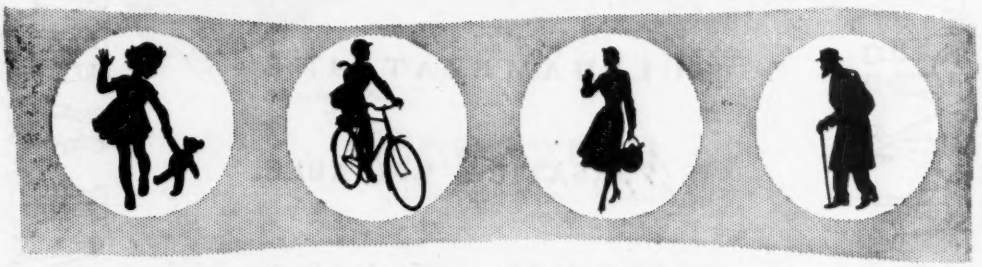

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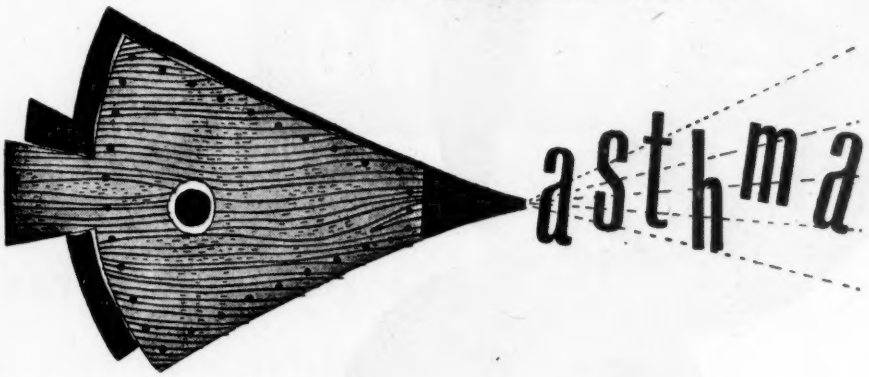

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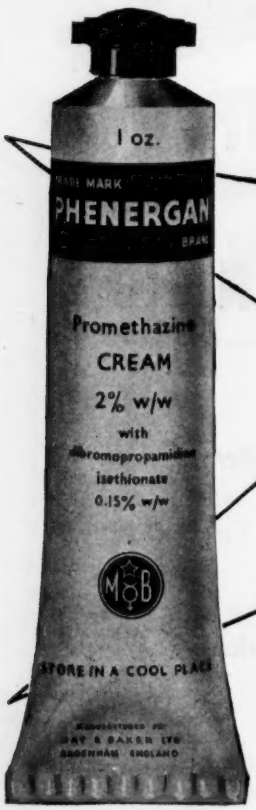

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THE AUDITORY APPROACH IN THE TRAINING OF DEAF CHILDREN

D. B. FRY
Ph.D. Lond.

READER IN EXPERIMENTAL PHONETICS IN THE UNIVERSITY OF LONDON, AT UNIVERSITY COLLEGE

EDITH WHETNALL
M.S. Lond., F.R.C.S.

DIRECTOR OF THE AUDIOLOGY UNIT, ROYAL NATIONAL THROAT, NOSE AND EAR HOSPITAL, LONDON; CONSULTANT AURAL SURGEON, SCHOOL MEDICAL SERVICE, LONDON COUNTY COUNCIL

THE handicap of the congenitally deaf child is very great, for he is without means of communication. Failure to receive and understand speech inevitably involves a failure to produce speech. Hence the deaf child is reduced to gestures to indicate his wants, and his emotional and intellectual development is largely arrested. The association between speech and mental capacity has been recognised for so long that the word "dumb" has become an expression in everyday use to describe the dull-witted.

The problem of the congenitally deaf child has received attention now for very many years; yet no method of training and educating such a child has been clearly proved to be the best. Of the two main methods available the manual method depends on the use of signs for communication. One of its principal defects is that a child trained in this way, and in no other, is unable to communicate with more than a limited section—the deaf section—of the community. Because deafness is sometimes heritable as a recessive characteristic, this segregation encourages the propagation of deaf children—a fact commented on over and over again by those who have seen this side of the work. The second main method is the oral method. This has aimed at teaching the child to speak and to understand speech in others by means of lip-reading. Most deaf children have some hearing—the so-called residual hearing—and this has been used to help the child to speak. On the other hand few workers have used it as the main method of teaching speech.

Auditory Training

The *aural*, or preferably the *auditory*, method, is a development of the oral method. Its aim is to enable the deaf child to develop hearing and speech as a hearing child would primarily through listening. To do this training must be provided at the period when speech normally develops.

Auditory training is not new. Ernaud in 1761 showed that deaf-mutes with residual hearing could be trained to hear words. In 1768 he reported on a patient who had progressed to sentence-hearing through speech into the ear. Pereire in 1768 thought that all deaf-mutes could be taught word hearing. Itard in 1802 was the first to show that by methodical listening practice the congenitally deaf child acquired an increased power of auditory perception. The children were trained to hear the difference between noises. This was comparatively easy. The next stage was to teach them to distinguish between vowels. This was considerably more difficult, but after several days' training the pupils could do this. Consonants were much harder still, and the work took a long time, but he considered the method well worth following.

Urbantschitsch was the second to practise systematic training of the born deaf. He classified hearing as follows: total deafness, tone-hearing, vowel-hearing, word-hearing, and sentence-hearing. He reported that, though those with the most residual hearing made the most progress, it had been possible to teach partial perception of speech sounds even to those who at first appeared totally deaf. Of 22 pupils with vowel-hearing all achieved word-hearing, and 6 of them sentence-hearing. In 1895 Urbantschitsch reported that tests of hearing made after auditory training showed that only 1–3% were totally deaf. The significance of these figures is seen by comparing them with those of Bezold (1899), who classed 20% as totally deaf and considered the practical value of auditory training insignificant, and with the results of a recent analysis of unselected cases (see table) seen at the Audiology Unit where auditory training is given.

Since Itard and Urbantschitsch others have been convinced of the value of auditory training. The increased use of hearing-aids has stimulated a great interest in auditory training during the last few years, and today the method is being used in audiology centres in many parts of the world. Nevertheless it has not yet been universally accepted, and there are many children in

ANALYSIS OF UNSELECTED CASES SEEN AT THE AUDIOLOGY UNIT WHERE AUDITORY TRAINING IS GIVEN

Type of deafness	No. of cases	Degree of deafness: Total	Subtotal	Partially deaf: Severe	Moderate	Slight
Congenital:						
Hereditary ..	76	1	27	39 (2 H.T.L.)	7	2
Familial	70	0	24	37	6	3
Maternal rubella ..	53	0	16	34	3	0
Influenza during first three months of pregnancy. ..	4	0	3	1	0	0
Rhesus factor ..	26	1	3	22	0	0
Toxæmia of pregnancy	22	0	10	9	1	2
Prematurity ..	15	0	4	10 (3 H.T.L.)	0	1
Prolonged or difficult labour (forceps, birth injury)	40	1	20	14 (1 H.T.L.)	4	1
Cerebral palsy ..	15	0	4	7	3	1
Parental otosclerosis	17	0	2	6 (3 H.T.L.)	5 (1 H.T.L.)	4 (2 unilat.)
Sporadic	153	2	46	86 (6 H.T.L.)	13 (3 H.T.L.)	6 (1 unilat.)
Total ..	491	5	159	265 (15 H.T.L.)	42 (4 H.T.L.)	20 (3 unilat.)
Acquired:						
Tuberculous meningitis	62	4	31	18	4	5 (1 unilat.)
Meningococcal meningitis ..	56	4	28	12	8	4 (2 unilat.)
Pneumococcal meningitis	12	0	5	5	0	2 (1 unilat.)
Mumps	4	0	0	0	0	4 (4 unilat.)
Other specific fevers	13	0	1	2	5	5 (2 unilat.)
Influenza	3	0	0	3	0	0
Chronic suppurative otitis media	83	0	0	24 (2 mastoid operations)	34 (3 mastoid operations)	25 (4 mastoid operations)
Chronic adhesive process	19	0	0	8	6	5 (1 unilat.)
Allergy	20	0	0	3	6	11
Throat infections (tonsils and adenoids) ..	29	0	0	0	4	25
Trauma	8	0	0	5	1	2 (2 unilat.)
Total ..	309	8	65	80	68	88 (13 unilat.)

H.T.L., high tone loss.

schools for the deaf who could have been in ordinary schools, had they been given auditory training at the right age.

There appears to be really only one reason why auditory training has not been accepted, and that is lack of understanding of the development of hearing and speech in the young child and of what constitutes normal hearing.

Normal Hearing

The term "normal hearing" implies the ability to recognise or understand sounds which are heard. A sound may be audible without being understood—e.g., speech which is very faint or speech in a foreign tongue of which the listener has no knowledge. The ability to recognise the meaning of sounds or of words is by far the most important factor in normal hearing. It is called auditory discrimination and has to be learnt by the auditory centres in the cortex. A sound is not learnt on once hearing it but only through frequent repetition; memories of sounds and associations with their meaning are acquired slowly. The exact use made of these memories will depend partly on the intelligence of the child and partly on the environment and opportunities of listening.

Auditory discrimination is learnt during the first three years of life. The infant first learns to discriminate between sounds and then more slowly learns to understand speech through continual listening. The learning of the complicated control of the muscles of articulation follows close behind the ability to discriminate. The importance of these early years in the acquisition of speech has been described by many writers. The period about the age of 12–18 months has been called a period of "readiness to speak" (Stinchfield and Young 1938). It is important to realise that understanding of speech always precedes the production of speech, and therefore a period of "readiness to listen" must occur during the first year of life. As auditory discrimination develops, the child will produce sounds similar to those he hears.

It is interesting to see the order in which the speech sounds are learnt. The vowels, which are loud and do not require such complicated articulatory movements as the consonants, are learnt first. The consonants are weak sounds and contain mainly high-frequency components. It is commonly observed that the sibilant fricatives tend to be acquired later than other sounds, because of the mechanical difficulty of producing them. Sheridan (1948) found *th* the last sound of all to be acquired, and this is the weakest of all speech sounds. In the normal child the first words are used at about 1·1 years (Burt 1952). Words are soon formed into short phrases or speech patterns. Long before the child is using these patterns, however, he can understand them, as is shown by the fact that he will obey simple commands.

Cases have been described of children with normal hearing who have not learnt to speak during these early

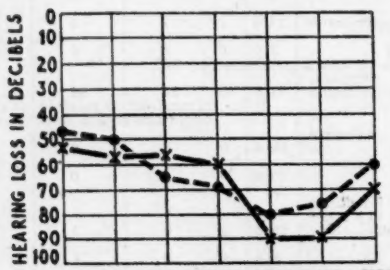

Fig. 1

Boy, aged 9, deaf after influenzal meningitis: ×, right; ●, left.

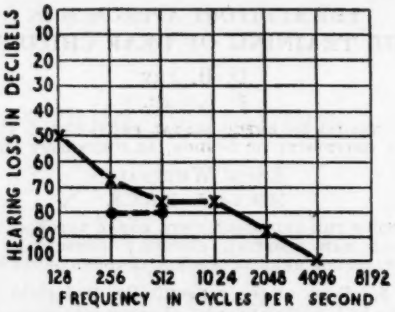

Fig. 2

Man, aged 81, with presbyacusis, could not hear any words correctly without hearing-aid, but heard 55% correctly with hearing-aid. Follow-up after six weeks showed disability overcome: ×, right; ●, left.

critical years; speech was acquired only very slowly and was never fluent. It is now accepted that the cortical centres can learn to discriminate between auditory stimuli readily during the first three years of life, whereas after this period learning becomes increasingly difficult. The deaf child without training does not receive sufficient auditory stimuli to learn to make these discriminations. Auditory training is the means by which the cortical areas are given additional practice in the discrimination of sounds—both the background sounds of everyday life and speech patterns.

If speech is to be understood by the adult who has learnt it in the normal way, it must have adequate intensity and the right frequencies must be present. When speech is at very low intensities it is heard without being understood, and it is most intelligible when the intensity is 50–60 decibels above threshold. Some words are more difficult to understand than others, and there may be as much as 30 decibels difference in intensity between the sounds of which they are composed. Words are more easily understood in context in a sentence than in isolation, for if a few words are missed the meaning can be supplied from the rest of the sentence. Words are recognised more by their consonants than by their vowels. Consonants are recognised chiefly by their high-frequency components, and if these frequencies are not heard words become unrecognisable. Even the normal listener may have difficulty in understanding speech in a noisy restaurant or on the telephone. This is because the high frequencies are either masked or missing. In the case of the telephone new words or names may have to be spelt out, familiar words being used to enable the listener to distinguish between the phonetic elements: F for Freddy, S for sugar.

Effect of Deafness on Speech Sounds

If deafness comes on suddenly, as in meningitis, the listener cannot recognise speech, partly because it is too faint and partly because of the sudden loss of hearing for the high frequencies. If, however, auditory training is given as soon as the child is well enough (Walker 1952), it may be possible to relearn the speech sounds now heard, just as one would learn a foreign language.

A boy, aged 9 years, became severely deaf after influenzal meningitis. At first he could hear the voice at the meatus but could not distinguish words. Now, after early and adequate auditory training, he is making satisfactory progress in an ordinary school (fig. 1).

Deafness of slow onset, even though perceptive in type and causing a loss of hearing for the essential high frequencies, never causes quite the same disability. This is because the patient has time to learn various ways of compensating for the disability. It is important to realise

that a degree of deafness which might not be enough to prevent an adult speaker from understanding speech may be quite sufficient to prevent a child from learning. Once speech is learnt, the omission of the high frequencies does not impair the recognition of words to anything like the same extent.

Fig. 2 is a typical audiogram of an adult patient of this type. The patient, aged 81, has perceptive deafness. He is so deaf that at three feet without an aid he hears nothing; but with the aid, before he had had any practice, he recognised 55% of words.

It is well known that an elderly person with perceptive deafness is one of the more difficult deaf patients to help, but in this type of patient, as in many others, the disability is overcome by the use of a suitable hearing-aid. The degree of deafness which most adults have before seeking a hearing-aid is such that if it were present at birth it would have prevented them from learning speech without special help. Thus the disability of even a severe degree of deafness can be overcome in the adult who has learnt speech in the normal way through hearing.

Bunch (1943) describes two cases of deafness with an identical hearing loss as measured by a pure-tone audiogram. In one case speech had been acquired normally through hearing, and, when deafness came on, the patient could continue to understand speech with a hearing-aid after very little practice. The second patient had never learnt to use his hearing, and speech sounds had no meaning for him. In this case an aid was of no help.

Fig. 3 shows two cases of congenital deafness with a similar hearing loss. In (*a*) the deafness had been suspected by the mother who, by talking always close to the child's ear, taught her to use her hearing and to speak. She is making progress in an ordinary school and uses an aid continuously. The second case (*b*) received only a little auditory training, and this was given when she was too old to benefit. She can discriminate between vowels and one or two familiar words only. She is in a school for the deaf.

Thus it is seen that a very severe degree of deafness need not prevent the child from learning, provided that the deafness is detected early enough and that during the period of readiness for speech there is a continual repetition of sounds within the child's range of hearing. Case (*a*) described under fig. 3 is one of a group of similar cases. An investigation into these showed that the mother always suspected the deafness *early* and always talked close to the child's ear. Thus it is evident that it is the learning period of speech which is so important. It appears remarkable that it should be possible for these children to learn speech when so much of the speech-frequency range is missing. The explanation is that the young child can learn to discriminate between almost any sounds, provided they are presented often enough. The

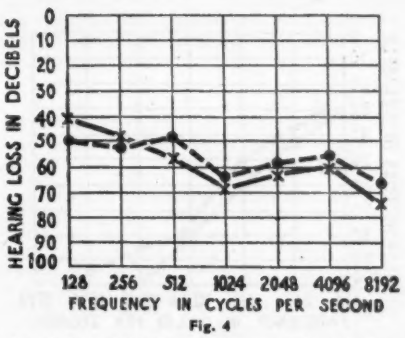

Fig. 4

Oct. 16, 1940: child born with congenital deafness due to maternal rubella. December, 1951: referred, ? fit to remain in ordinary school, becoming backward due to deafness. 1945: admitted to school for deaf, using some words. After 1 term lost speech, so was taken away by parents. Hearing: vowels 6–10 ft., consonants 2 ft., words and sentences at meatus. Recommended for hearing-aid and auditory training and to remain in ordinary school. 1952: progress now satisfactory.

number of different languages and dialects in the world points to this, and the sounds of an unknown language which remain meaningless to an adult are nevertheless easily learnt by a child. Once speech has been learnt, the child will get help in understanding from the context of words in sentences.

Auditory Discrimination for the Deaf Child

So that the deaf child may learn to discriminate, we must try to reproduce the conditions in which the normal child learns to listen.

Age

The right time to start training the deaf child is during the first year of life. The mother should be taught how to do this, for she can give the individual and constant attention which every person who speaks has had. There is no short cut which will eliminate the need for repetition of sounds, if the auditory areas in the cortex are to learn. The child trained at this early age can develop speech during the normal physiological period.

The Hearing-aid

Each child should have an individual hearing-aid, which must be small and easily worn. He must always wear the aid so that he may hear sounds continually. The difference in response by the young and by the older child to the use of a hearing-aid is remarkable. The young child likes his aid, wears it all the time, and is upset without it. The older child is upset with it and will always be finding excuses for not wearing it. He is past the age at which discrimination can be learnt, and all sounds to him are noises. In addition he is a fixed visualiser. The child with an acquired deafness of severe degree will learn to lip-read to help his remaining hearing; but, once the congenitally deaf child whose hearing is untrained has been taught only to lip-read, he seems incapable of adding the ability to listen.

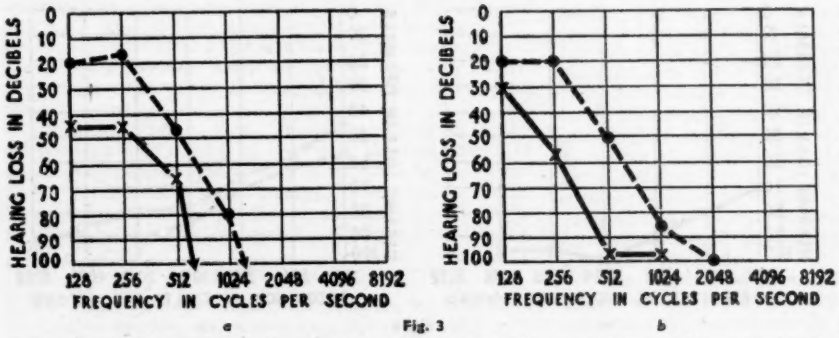

Fig. 3

Two cases of congenital deafness with similar loss of hearing: *a*, child's mother taught her to use her hearing and to speak, and child is making progress at school and uses a hearing-aid continuously; *b*, child received only a little auditory training when too old to benefit, can discriminate between vowels and one or two familiar words only, and is in a school for deaf: X, right; ●, left.

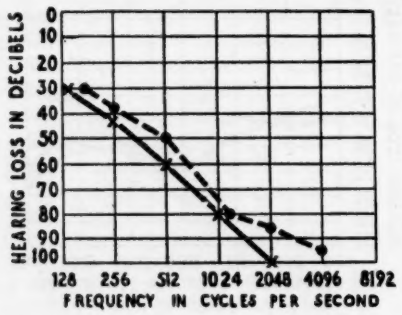

Fig. 5

Feb. 10, 1946: child with congenital deafness. May 4, 1951: deafness suspected because late in talking; understands a few words; speech attempted but unintelligible. 1951: recommended for hearing-aid and auditory training, went to ordinary school in September, 1951. 1953: making normal progress in ordinary school, and comprehends sentences across the room with hearing-aid and lip-reading: X, right; ●, left.

	—	1951	1953
Hearing without hearing-aid or lip-reading	Vowels	Left meatus only	4–10 ft. right and left
	Consonants	Nil	1–2 ft. right and left
	Words	Nil	Meatus right and left
	Sentences	Nil	2 ft. right and left

Environment

Environment is a major factor in training a deaf child to use his hearing. It is useless to expect a child handicapped by deafness to learn speech under conditions in which a normally hearing child would fail, or would certainly be retarded. In a residential nursery even a child with normal hearing may be retarded in speech, because of the absence of individual attention.

It is well known that in the absence of special training a child who acquires deafness during the early years of life will lose his speech because he no longer hears his voice or the speech of others. In the same way the congenitally deaf child who by the age of 4 or 5 years has learnt a few words may lose his speech if put into a school for the deaf (fig. 4).

Assessment of Improvement in Discrimination

The signs by which the progress of learning may be estimated include changes in behaviour and in hearing and speech. The better means of communication which the child is developing will reduce frustration and temper outbursts. If the deafness is diagnosed early enough and training is begun, this phase of frustration can be eliminated (Galbraith 1952).

Changes in Speech and Hearing

As speech reception improves, this will obviously show itself in a better comprehension of speech by the child. A child's comprehension of speech can be measured to some extent by finding the relation between word-hearing and sentence-hearing. In partially deaf children—other than those who have been adequately trained—hearing for isolated words is usually better than hearing for sentences. Thus, although words may be heard at 3 feet, or at even greater distances, sentences may be heard only at the meatus or may not be heard at all. This effect we attribute to an arrest in the development of speech patterns; it tends to be found in the following groups:

(1) Children who are partially deaf and are referred to an otologist because of failure to make progress in an ordinary school.

(2) Children trained by group methods in schools for the deaf.

(3) Children who have received auditory training too late.

The normal adult relation between word-hearing and sentence-hearing is found in children who, although very deaf, are making progress in an ordinary school. This group contains those who have received auditory training and have been taught the proper use of their hearing with a hearing-aid (fig. 5).

Is there an age at which the normal child hears and comprehends words more easily than sentences, or is this a peculiarity of the deaf? In a group of 20 normally hearing children $2^1/_2$–4 years of age, it was found that, whereas the children could easily repeat simple sentences heard at 15 feet, they could not repeat words heard at this distance unless these words had been heard once or twice at 5 to 6 feet. Further work is being done on this problem.

Improvement in speech production follows closely upon improvement in speech reception. Both are related to the improvement in auditory discrimination which is evident in every case where auditory training has been given.

Effect of Auditory Training on Results of Tests of Hearing

Fig. 6 shows the apparent improvement in hearing with auditory training in one of the first children admitted to the new Partially Deaf Units in the London County Council in 1947. This apparent change in a child's hearing when trained has been described by several workers (Goldstein 1939, Wedenberg 1951, Huizing and Pollack 1951); and tests of hearing must take it into account.

Few children are so deaf that they cannot hear sound at all: most have some hearing, though sounds loud enough to be heard by them occur so rarely that they do not acquire meaning. Children with a little hearing may have learnt to discriminate between noises but not between speech sounds. Sounds which have been learnt become familiar and are then easy sounds, which can be heard and understood at greater distances than new and difficult sounds could. It is impossible to test a child's

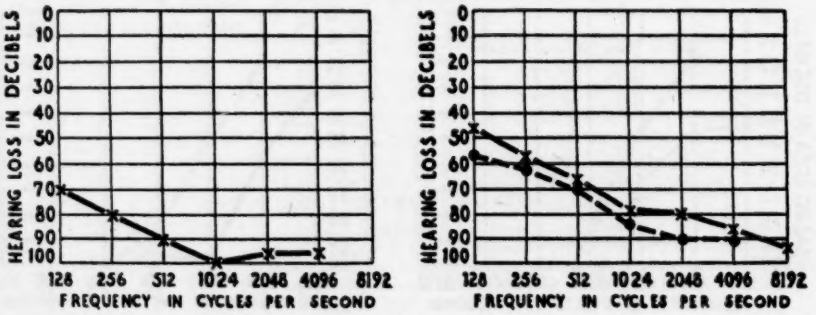

Fig. 6

Apparent improvement in subtotal congenital deafness after auditory training: *a*, April, 1947, responded to castanet at 6 ft., but not to voice; *b*, May, 1953, understood speech at 3 in. from either ear, and words at 4 ft. and sentences at 6 ft. with hearing-aid (without lip-reading) and was making progress in ordinary school. X, right; ●, left.

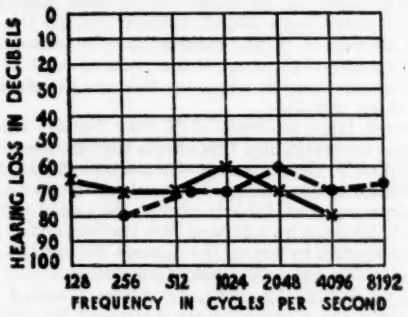

Fig. 7

Sept. 19, 1946: child with subtotal congenital deafness. October, 1949: neither talks nor understands speech; hears vowels at 1 ft. and drum at 10 ft.; hearing-aid and auditory training prescribed. June, 1951: in ordinary school and understands and repeats words heard at 2 ft. without either hearing-aid or lip-reading. July, 1953: making good progress at ordinary school.

hearing accurately until the residual hearing has been trained. The intelligent child will make full use of a few clues which would be of less value to the less intelligent.

It is the child's ability to hear and understand speech after adequate auditory training that is important. This improvement in a child's hearing with training has led us to believe that many severely deaf children, if given the opportunity, could be educated in ordinary schools. The child who at the age of 4 to $4^1/_2$ can discriminate vowels at the meatus when first tested, and whose speech consists of a few unintelligible words, can be enabled by auditory training with a hearing-aid to make good his deficiency in auditory discrimination and to be educated in an ordinary school (fig. 5 and accompanying table).

We can now select these children at an earlier age—2 or 3 years—and have shown that where a child hears (though he does not understand) the voice at 1 or 2 feet, and hears a drum at 10–15 feet, he has enough hearing to enable him to learn speech through his hearing, and, when trained, to go to an ordinary school (fig. 7) (Whetnall 1952).

Even when there is no response at the first examination, all children should be given the opportunity of receiving auditory training with a hearing-aid. In some cases they will be found after several months to have an appreciable amount of hearing.

Although the results are quite good at 2 or 3 years, the ideal is to start as soon as possible after the birth of the child, so that the listening opportunities can approximate as nearly as possible to those of the child with normal hearing. The earliest age at which we have given a hearing-aid to a child is 10 months, and there are several others who received their aids when not very much older than this. Most of these children are developing almost normally.

Auditory training, then, should be given to every congenitally deaf child if he is to have the best chance of developing normal speech and of establishing comparatively normal social relationships. The method should be applied as widely as possible until such time as deafness in these young children can be prevented altogether.

Conclusions

The auditory method aims at enabling the deaf child to develop hearing and speech as a hearing child would, through listening. The method is based on the normal development of auditory discrimination and of the comprehension and production of speech. Training should begin young, preferably in the first year of life; a small monopack hearing-aid should be worn continuously; and the child should be kept in an environment where there are things to hear. With adequate and early auditory training, many deaf children are capable of holding their own in ordinary schools. No final decision should be taken about the educational classification of a deaf child until he has been tested after adequate training.

We should like to thank the members of the staff of the Audiology Unit who have helped in the testing and given the auditory training described in this paper. We acknowledge with thanks the permission of the Fifth International Congress of Otorhinolaryngology to use table I and figures 4 and 7 from the paper read by one of us (E. W.) at the Congress at Amsterdam in June, 1953.

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WATER INTOXICATION

DIFFERENTIAL DIAGNOSIS OF THE HYPOTONIC SYNDROMES

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A HEALTHY person can safely drink a large volume of water. Sick people, however, may not excrete an excess of water, which, if given without electrolytes and retained in the body, dilutes the body-fluids and lowers their osmotic pressure. The resulting hypotonicity produces symptoms which mostly reflect disordered cerebral function. This condition was first described by Weir et al. (1922), who called it "water intoxication." It may complicate any illness in which free intake of water is associated with reduced excretion, as in some forms of cardiac, hepatic, or renal insufficiency, and particularly in prolonged anuria (Hamburger and Mathé 1952). But the most acute cases arise mostly in the immediate postoperative period (Helwig et al. 1935, 1938, Ariel 1951, Zimmerman and Wangensteen 1952). We report here further such cases, and also describe severe water intoxication developing gradually and insidiously over a number of postoperative days. These patients did not have persistent oliguria or other evidence of renal failure, such as increased blood-urea or a disturbance of acid-base balance. Our account is based on 24 patients of whom half had severe symptoms. The metabolic details will be reported separately.

Water intoxication is not widely recognised, and indeed Homer Smith (1951) dismisses it in a few words as a rare condition. In our experience it is not uncommon, but it is often overlooked or mistaken for sodium (Na) depletion. This error arises through misinterpreting the biochemical sign—namely, a low plasma-Na concentration—which is always present in water intoxication, and which may

also be found in severe Na depletion. A third condition, in which a low plasma-Na concentration occurs, also needs consideration: we have here called this "symptomless hypotonicity." The three conditions—water intoxication (Na dilution), Na depletion, and "symptomless hypotonicity"—comprise the hypotonic syndromes. More than one of these syndromes may be found in the same case.

Physiological Aspects of Hypotonicity of Body-fluids

EFFECTIVE OSMOTIC PRESSURE OF BODY-FLUIDS

The cell-membrane is freely permeable to water, but relatively impermeable to some solutes, mostly electrolytes; osmotic adjustments occur by the movement of water across the cell membrane (Gamble et al. 1923, Peters 1935). Na salts normally comprise about 94% of the osmotically active solutes of the extracellular fluid (E.C.F.). Only the Na salts vary over a sufficiently large range of concentration to have a significant effect on the E.C.F. osmotic pressure, and hence upon the distribution of body-water. For practical purposes the plasma-Na concentration defines the effective osmotic pressure of the E.C.F. An exception is due to the osmotic action of glucose (Verney 1947), which is temporary if the tissues can metabolise it. For this reason 5% glucose in water, which is isotonic at first, ultimately has the effect of an infusion of water. Except in hyperglycæmia a low plasma-Na indicates hypotonicity; a high plasma-Na indicates the reverse. Similar definition of the E.C.F. osmotic pressure is not provided reliably by the plasma-chloride concentration, because this varies with the concentration of other anions such as bicarbonate, organic acids, phosphate, and sulphate.

CAUSES OF HYPOTONICITY OF BODY-FLUIDS [1]

Dilution of the body-fluids occurs, and the plasma-Na concentration falls, when water is retained without electrolytes, and when electrolytes are lost without water. Of the electrolytes, the bases Na and potassium (K) with accompanying anions may be lost in large amount; the loss of other bases—calcium and magnesium—is small and can be disregarded as a cause of hypotonicity (Darrow and Yannet 1936).

When water alone is retained, it is distributed between the E.C.F. and the intracellular fluid (I.C.F.) in approximately the proportions that would be expected from the relative volumes of these two fluid compartments. Normally the I.C.F. has roughly twice the volume of the E.C.F., and therefore two-thirds of the retained water enters the cells and one-third remains outside. The total body-water of a man weighing 60 kg. (132 lb.) is normally about 60% of body-weight, or about 36 litres. The addition of 3·6 litres of water would dilute his body-fluids, and the electrolytes, by 10%. If his plasma-Na concentration was, before dilution, 140 m.eq. per litre—a normal figure—after dilution it would fall to near 126 m.eq. per litre.

If 140 m.eq. of Na were lost from the E.C.F., and no water were lost, the plasma-Na concentration would fall; but the resulting E.C.F. hypotonicity would cause water to pass into the cells to restore the osmotic equilibrium (Darrow and Yannet 1935). The observed fall of plasma-Na concentration would be no greater than if the Na were actually lost from the whole of the body-fluid, rather than from the E.C.F. alone. It follows, then, that the fall in plasma-Na concentration would be about the same if either 140 m.eq. of Na were lost without water, or if 1 litre of water were added, without Na, to the body-fluids. Therefore, in the theoretical case already cited, the loss of only 140 m.eq. of Na reduces by 1 litre the amount of excess water necessary to lower the plasma-Na to 126 m.eq. per litre.

Although large amounts of K may be lost from the I.C.F., it is uncertain how this affects the osmotic pressure and the distribution of water. Elkinton et al. (1944) give K the same osmotic value as Na in calculating the diluting effect of water; and if this is correct, the loss of 140 m.eq. of K would reduce by a further litre the amount of excess water necessary to lower the plasma-Na to 126 m.eq. per litre in the example already considered.

Thus, in our 60 kg. man, 3·6 litres of added water would lower the plasma-Na concentration by 10%, but only 2·6 litres would be required if 140 m.eq. of Na was lost, and this volume of water probably would be even less if there were K loss as well. Base losses, small in themselves and in other circumstances not of particular importance, materially increase the hypotonicity when water is being retained.

RENAL REGULATION OF WATER EXCRETION

Verney (1947) has demonstrated the importance of antidiuretic hormone (A.D.H.) of the pituitary gland in controlling water excretion in response to small changes in the effective osmotic pressure of the E.C.F. Smith (1951) and Le Quesne and Lewis (1953) suggest that an excessive production of A.D.H., which leads to water retention and hypotonicity, may follow surgical operations, trauma, hypotension, reduction of blood volume, pain, fear, and administration of some drugs including anæsthetics, analgesics, nicotine, atropine, acetylcholine, and histamine.

Deficiency of adrenal cortical hormones results in delayed excretion of water or in water retention. In anterior hypopituitarism this effect may be even more distinct, possibly because other hormones, such as the growth, thyroid, and sex hormones, are deficient as well.

Other causes of failure of an expected diuresis, and of the retention of excess water, include organic renal disease, functional renal impairment secondary to anoxia, greatly diminished renal blood-flow, and grossly lowered glomerular filtration-rate.

The occurrence of prolonged hypotonicity without associated diuresis, and in the absence of adrenal insufficiency or organic renal disease, has stimulated inquiry into the possible existence of antidiuretic factors other than those put forward by Verney. Borst (1948) has described water retention in conditions associated with impairment of the blood circulation, anoxic anoxia, anæmia, and low serum-proteins. Leaf and Mamby (1952) refer to the possible existence of "volume receptors" which stimulate antidiuretic activity when the E.C.F. volume, or some critical portion of it, is reduced.

The Hypotonic Syndromes

SYMPTOMLESS HYPOTONICITY

In 1938 Winkler and Crankshaw described persistent and resistant low plasma-Na in some cases of pulmonary tuberculosis and bronchial carcinoma. It is now recognised that this abnormality may be found in any chronically ill patient, and in our experience operation sometimes precipitates the condition when it was not evident before operation. The range of plasma-Na in this group has not been determined. In our patients it falls between 125 and 133 m.eq. per litre, but values persistently below 127 m.eq. per litre are unusual.

This condition is distinguished from both true Na depletion and Na dilution by its chronicity and by the failure of added salt or water restriction to correct the hypotonicity (see table I and case 6). The cause of the condition is not known; it is possible that there is

1. Black (1952) has commented upon the lack of detailed metabolic studies of water intoxication in man. In this section the account is based largely on the data of Elkinton et al. (1944), and our own experimental observations (unpublished). But until further data are available, this account cannot be regarded as more than an approximation close enough for clinical purposes.

primary lowering of the intracellular osmotic pressure (Sims et al. 1950). Broch (1945) claims that the cells are not abnormally swollen with water as they are in Na depletion and in water intoxication. Perhaps this is one reason why the disorder is symptomless.

SODIUM DEPLETION

We wish to discuss only one question concerning this condition (Black 1953): To what level does the plasma-Na fall in Na depletion? It is widely believed that a low plasma-Na is the natural result of Na depletion. But clinically Na is usually lost with fluids whose Na content is equal to, or less than, that of the plasma; and there is continuous loss from the body of almost pure water in the insensible perspiration and the water of the expired air. Consequently in most patients the loss of water is greater than that of Na, relative to the normal Na/water relationship of the E.C.F. The loss of more water than Na does not lead to a fall in the plasma concentration—in fact it will tend to rise. The situation can only be different when there is a free intake of water. In this case our question is: To what level does the plasma-Na fall in Na depletion without water depletion? Experimentally, in such circumstances, McCance (1936) showed that the loss of 350–500 m.eq. of Na caused hardly any fall in the plasma-Na concentration in normal persons weighing 50–70 kg., because the osmotic pressure of the E.C.F. was preserved by the renal excretion of an amount of water equivalent to the Na lost. The volume of the E.C.F. decreased as did the plasma volume, and the body-weight fell. Further Na loss, however, was not accompanied by corresponding loss of water, so the plasma-Na concentration fell, and this hypotonicity was associated with the movement of water into the cells. Only when the Na loss was about 1000 m.eq., or approximately 50% of the initial amount in the E.C.F., did the plasma-Na concentration fall by up to 17 m.eq. per litre from the initial value. These findings were confirmed by Nadal et al. (1941); and similar conclusions emerge from the clinical reports of Moore and Ball (1952) and Black (1953). It follows, then, that a very low plasma-Na concentration can only be due to Na depletion without water depletion when the Na loss is very large. If the Na loss has only been moderate other factors must be considered—symptomless hypotonicity, Na dilution by primary water retention, or a combination of these conditions. The symptoms and signs of Na depletion without water depletion are shown in table I.

WATER INTOXICATION

That water retention and hypotonicity may follow gross sodium depletion has already been mentioned. But dilution of the body-fluids may occur when there is no electrolyte loss. This condition can be described as sodium dilution by primary water retention, or, when symptoms are produced, as water intoxication. Since hypotonicity and an increase in the water content of the cells is common to both water intoxication and sodium depletion without water depletion, certain similarities in the symptoms and signs might be expected, and are in fact found. But there are substantial differences (table I) which have important implications in pathogenesis, prognosis, and treatment. We will confine our account to the condition as it occurs in surgical patients.

Ætiology

Surgical patients are especially vulnerable to water intoxication, because of the disturbance of renal function which follows trauma, and because it is often necessary to resort to parenteral-fluid therapy. After operation there is usually anuria or oliguria for 12–36 hours. Le Quesne and Lewis (1953) attribute this to excessive secretion of A.D.H. Postoperative water intoxication is most commonly reported to have occurred during this period (Zimmerman and Wangensteen 1952). This is always due to an evident error in fluid therapy. Rectal

TABLE I—DIFFERENTIAL DIAGNOSIS OF THE HYPOTONIC SYNDROMES

—	Na depletion without water depletion	Water intoxication	Symptomless hypotonicity
History	Large negative Na balance. Free intake of water.	Large positive water balance acutely or gradually produced.	Any chronic illness. Zero external balance of water and Na.
Symptoms	Gradual onset. Apathy and weakness; sometimes restlessness and anxiety; postural faintness, anorexia, nausea, vomiting, muscle cramps.	In *acute* cases: sudden onset; mental disturbances, disorientation; weakness; fits; coma. In *chronic* cases: gradual onset; extreme prostration and weakness; sleepiness; disorientation; apathy; anorexia; fits.	No symptoms referable to hypotonicity.
Signs:			
Weight	Loss.	Gain.	Progressive loss.
Appearance	Haggard.	Normal.	Usually wasted.
Skin	Loss of tissue turgor and elasticity.	No abnormality.	Loss of elasticity.
Cardiovascular system	B.P. low, especially pulse-pressure. Pulse rapid. Central venous pressure reduced. Veins collapsed. Limbs pallid and cold.	B.P. normal or raised. Pulse normal. Central venous pressure normal. Veins full. Limbs normal colour and warm.	B.P. normal. Pulse normal. Central venous pressure normal. Veins full. Limbs normal colour and warm.
Nervous system	Some muscular weakness and sweating.	Gross muscle weakness. Diminished or absent tendon-reflexes. No sweating. In acute cases coma and extensor plantar responses.	No special signs.
Respiration	No special change.	Over-breathing in acute cases.	No special change.
Chemistry:			
Hb and hæmatocrit	Raised.	Low.	Usually low.
M.C.H.C.	Low.	Low.	Normal.
Plasma proteins	Raised.	Low.	Low. Reversal A/G ratio.
,, Na and Cl	Low.	Very low.	Low.
,, K	Often raised.	Normal or low.	Normal or low.
,, HCO_3	Low.	Low in acute cases.	Normal or slightly raised.
,, N.P.N.	Raised, sometimes very high.	Normal or low unless previously raised.	Normal except in renal failure.
Urine volume	Low.	Low or high.	Normal.
,, S.G.	Usually high.	Usually low.	Usually low.
,, protein	Trace to much.	Trace or nil.	Nil.
,, casts	Usually present.	None.	None.
,, ketone bodies	Usually present.	Absent.	Absent.
,, Na content	Zero or very low except in Addison's and renal diseases.	Often high.	No specific findings.
Treatment	Correct hæmoconcentration; normal saline effective. Hormones in adrenal insufficiency.	Correct hypotonicity by hypertonic saline and water restriction; normal saline ineffective and dangerous.	No treatment for hypotonicity indicated.

water produced severe and acute intoxication in two patients described by Helwig et al. (1935, 1938) and in some of our patients (e.g., cases 1 and 2).

Although the oliguria of the immediate postoperative period is now well recognised, the more prolonged failure of osmoregulation, due to reduced ability to excrete water, is often overlooked. In several of our patients the 24-hour urine volume was limited to about 1–1·5 litres for some days after operation despite excessive water intake. The longest period over which we have observed this abnormality was 12 days (case 5). In such patients water intoxication may occur, but there may be no other sign of renal failure, such as increased blood-urea or disturbance of acid-base balance (cases 3–6). There may be no evident reasons for the reduced ability to excrete water so long after the operation; but all our patients with this abnormality have been elderly or chronically ill or have had extensive operations. Further factors that may adversely affect renal function are acute blood-loss, prolonged hypotension, excessive pain, electrolyte loss, severe anæmia and low serum-proteins, cardiac hepatic or organic renal disease, and adrenal cortical insufficiency. It is also possible that the hypotonicity itself affects the kidney, tending to perpetuate the disorder (Bristol 1951).

When urine output is restricted to about a litre per 24 hours, in the absence of alimentary loss, the only other significant loss of water from the body occurs by sweating, insensible perspiration, and the water of the expired air. In a man weighing 60 kg. (132 lb.) this loss may be as low as 800 ml. per 24 hours. A water intake of some 2·8 litres would provide a daily excess of about a litre, and over several days excessive dilution of the body-fluids would occur. Unless the record of the fluid balance is carefully kept such an excess of intake may pass unnoticed. Base losses, small in themselves, and in other circumstances of not much significance, act with water retention to produce profound hypotonicity. In our view this accounts for the fact that patients may develop severe water intoxication when, as Zimmerman and Wangensteen (1952) point out, they do not seem to have received a great excess of water. A further factor in such patients may be that, before operation, the plasma-Na was already low because they had "symptomless hypotonicity."

While water intoxication is most commonly produced by parenteral fluids and rectal water, we have observed a number of cases in which the water intake was by mouth and under voluntary control. It has been stated that "voluntary intake of fluid is not likely ever to cause water intoxication," and that "water cannot harm thirsty patients" (*Lancet* 1953). There are important exceptions to both of these statements. We have observed patients who have had severe body-fluid dilution and yet complained of thirst (e.g., case 3); and the same observation has been made by Schroeder (1949) and by Leiter et al. (1953). In three of our patients, all of whom had chronic renal failure but were excreting more than a litre of urine per 24 hours, severe symptoms of water intoxication occurred. They had all developed over some years the habit of a large water intake, and possibly this is not easily broken even when dangerous hypotonicity exists. Possibly, too, the other metabolic abnormalities of renal failure, which these three patients had, were responsible for the disturbance of their thirst mechanism. We have also observed a patient who had anterior hypopituitarism following the surgical removal of the pituitary gland 14 years before, whose plasma-Na concentration was only 116 m.eq. per litre. This was shown to be due to water retention, and yet this patient stated that she was "always thirsty."

Pathology

As we have already said, the retained water is distributed over the whole of the body-fluid, some two-thirds being located in the cells. The E.C.F. is expanded but not sufficiently to produce pitting œdema. Nor is pulmonary or cerebral œdema produced. The symptoms are possibly due to cellular overhydration, especially of the brain cells. At autopsy no gross lesion may be found, and therefore the condition is easily overlooked as a cause of death. Helwig et al. (1935) have described the microscopic findings.

Symptoms

The symptoms of water intoxication which develop acutely differ somewhat from those where water intoxication develops gradually over a number of days. In acute cases symptoms may start with dramatic suddenness and alarming intensity, and are at first usually cerebral. Strange behaviour, loss of attention, confusion, staring, aphasia, incoördination, and sleepiness, interspersed with periods of violent behaviour and shouting delirium and extreme muscular weakness, very soon may be superseded by fits, coma, and over-breathing, sometimes of great intensity. In less severe cases the symptoms may resemble those in the more gradually developing condition. In these latter patients symptoms are insidious in onset and begin with lethargy, which may proceed to extreme prostration, and muscle weakness, sleepiness, apathy, and disorientation. Anorexia, nausea, and vomiting may occur, but headache and muscular cramps have not been evident in our patients. Because of the general nature and insidious onset of the symptoms they are likely to be attributed to other causes—especially Na and K depletion, uræmia, cholæmia, or bronchopneumonia. Severe water intoxication undoubtedly much reduces the patient's ability to withstand the effects of his primary illness.

There is considerable individual variation in the degree of hypotonicity which will produce symptoms. Hiatt (1951) reports severe symptoms in children with megacolon who were given watery enemata, and in whom the degree of osmotic lowering was not very great but was very acutely produced. In our experience symptoms may be expected with plasma-Na levels reduced to near 120 m.eq. per litre, but in one of our cases a plasma-Na level of 114 m.eq. per litre 48 hours after an operation caused only mild symptoms. In two patients in whom dilution took place more gradually, there were no symptoms with plasma-Na levels of 116 m.eq. per litre. Patients with latent or overt epilepsy are peculiarly susceptible to even small water loads (McQuarrie 1929). Rowntree (1926) observed that nervous and excitable dogs were more susceptible than placid animals to the effects of hypotonicity. From our observations we would expect that similar considerations apply in man; and that both an intracranial lesion and severe metabolic acidosis, as in uræmia, aggravate the symptoms.

Physical Signs

The signs of water intoxication are the reverse of those of sodium depletion, the condition with which it is most usually confused. Weight is not lost, but, on the contrary, gained; so the haggard appearance of dehydration is not present. The tissue turgor and elasticity and eye-ball tension are normal. The skin is warm, sometimes flushed, and moist. The blood-pressure (B.P.) is normal or sometimes raised, and the pulse-rate is normal. The veins are full, and the central venous pressure is not low. Muscle power may be greatly diminished or lost. In severe cases with coma, usually the plantar responses are extensor; the pupillary reflexes and the optic discs are normal; and the cerebrospinal-fluid pressure is slightly raised and the fluid contains no abnormal constituents.

Biochemical Findings

In acute dilution, the hæmoglobin (Hb) and plasma-protein concentration is usually reduced by an amount which reflects an increase in E.C.F. and in blood volume. The volume fraction of packed red cells (Ht.) is also

reduced, but not as much as the Hb because the red cells take up water. The increase in volume of the red cells is indicated by a fall in the mean corpuscular hæmoglobin concentration (M.C.H.C.). The plasma Na and Cl concentrations are reduced by an amount close to that which would be predicted from the water and base balance, assuming equal distribution throughout the whole body-water. The plasma-K is often low, but sometimes normal. The plasma-bicarbonate (HCO_3) is moderately reduced, and the blood-urea or plasma non-protein nitrogen (N.P.N.) is usually low unless there has been a period of anuria.

In gradually produced dilution compensatory changes may have restored the plasma K, HCO_3, and N.P.N. to normal, thus masking the general pattern of dilution which is so characteristic of the acute case.

Important information can sometimes be obtained from the results of urine analysis. The volume and specific gravity of the urine depend upon whether a diuresis has begun or not. The urine is usually free of albumin, formed elements, and ketone bodies, and the Na and Cl content may be quite high despite the very low plasma levels of these electrolytes.

Diagnosis

The acute onset of a neurological or psychological disturbance soon after operation should direct inquiry to the fluid-balance history. In acute water intoxication excessive amounts of water have been given and the plasma Na is low despite the absence of gross electrolyte loss. In gradually produced water intoxication the diagnosis is suggested by the symptoms (lethargy, prostration, and muscle weakness) and confirmed by the signs (low plasma-Na without dehydration, weight loss, and urea retention) and by the fluid-balance record. The symptoms are very similar to those attributed to K depletion (Eliel et al. 1950). In several of our patients (e.g., cases 3 and 5) the symptoms responded dramatically to treatment, despite the fact that, because no K was given, the coincident K depletion was unchanged or became worse. We regard this as evidence that the symptoms were not, predominantly at any rate, due to coincident K depletion.

Case-records

Methods.—Na and K: Flame photometry. Cl: Sanderson's (1952) potentiometric method. Plasma-CO_2 content: Manometric Van Slyke. Plasma total proteins and N.P.N.: Semi-micro-Kjeldahl with modifications devised in this laboratory by Fawcett (1954).

In cases 1, 2, and 4 balance data was derived by direct analysis of fluid intake and output, except for insensible water losses, which were assumed values (Adolph 1933). In cases 3, 5, and 6 limited conclusions were drawn from the ward fluid-balance records, and further evidence obtained, retrospectively, by balance studies from the start of treatment to clinical recovery. Body-weight was measured by scales sensitive to 15 g. (1 oz.) and checked by certified weights.

TABLE II—PLASMA CHEMISTRY AND BLOOD-PRESSURE IN CASE 1

Time	Na (m.eq. per litre)	K (m.eq. per litre)	Cl (m.eq. per litre)	TCO_2* (m.eq. per litre)	pH (arterial)	N.P.N. (mg. per 100 ml.)	Protein (g. per 100 ml.) Total	Protein Alb.	Protein Glob.	B.P. (mm. Hg)
Preop.	146	..	102	..	..	20	8·7	5·5	3·2	150/90
Postop. (*hr.*)										
54	110	4·0	78	19·5	7·45	35	7·0	4·2	2·8	140/85
72	117·5	3·9	81	24·4	..	..	7·4	..	..	110/55
83	127	3·3	94	21·0	..	..	7·2	..	..	125/55
96	143	3·6	102	27·4	7·35	..	6·6	..	..	..
120	139	3·9	100	25·4	..	22	6·7	..	..	135/80

* TCO_2 = total carbon-dioxide content of plasma.
Treatment: 0–20 hours, 9 litres of rectal water; 20–72 hours, no fluids; 72–81 hours, 450 ml. 6% NaCl (480 m.eq. NaCl).

TABLE III—PLASMA CHEMISTRY IN CASE 2

Time postop.	Hæmatocrit (%)	Na (m.eq. per litre)	K (m.eq. per litre)	Cl (m.eq. per litre)	TCO_2 (m.eq. per litre)	N.P.N. (mg. per 100 ml.)	Protein (g. per 100 ml.)
40 hr.	42	117	4·1	79	25·3	22	6·9
46 hr.	38	131	4·5	93	24·8	..	6·9
60 hr.	..	136	3·5	101	23·0	19	6·6
84 hr.	..	136	3·5	100	24·6	..	6·7
8th day	35	140	3·6	100	29·6	..	..

Treatment: 0–30 hours, 7 litres of rectal water; 40–46 hours, 250 ml. 6% NaCl (260 m.eq. NaCl).

Case 1.—In this case acute water intoxication was due to an excess of rectal water.

A man aged 52, weighing 70 kg. (154 lb.), had an anastomotic ulcer following a gastro-enterostomy 28 years before. Apart from anæmia (Hb 8·4 g. per 100 ml.), no other abnormalities were found. Plasma electrolytes were normal (table II). Vagotomy was performed uneventfully. A rectal water infusion was set up, and inadvertently the patient received and absorbed 9 litres in 20 hours. No urine was passed. At this time he looked pale, complained of tiredness and weakness, and slept a lot. Later he appeared distressed, was restless, and was over-breathing greatly. At 24 hours he had a generalised epileptic fit, lasting about 2 minutes. Thereafter he remained in deep coma for 56 hours. Examination revealed normal B.P. (140/90 mm. Hg) and pulse-rate (90), and warm skin. The tendon reflexes were sluggish, and both plantar responses were extensor. There was no neck rigidity, the pupils were dilated and reacted to light, and the fundi showed no abnormality. Subsequently the patient had three further generalised convulsions at about 2-hourly intervals. 24 hours after the onset of coma lumbar puncture showed clear fluid with a pressure of 168 mm. of cerebrospinal fluid; there were no abnormal constituents. A catheter was passed into the bladder, and during the next 6 hours 1 litre of urine was collected; this contained a trace of albumin but was not otherwise abnormal.

We saw the patient 30 hours after the onset of coma—that is, 54 hours after operation. The general findings were unchanged. Making reasonable allowances for the insensible losses, the water balance was +5800 ml., Na −70 m.eq., K −80 m.eq. Plasma analysis showed gross hypotonicity (plasma-Na 110 m.eq. per litre). Acute water intoxication was diagnosed. Because of the onset of diuresis it was felt that spontaneous recovery would occur. No active treatment, except water restriction, was given but during a further 18 hours only 1050 ml. of urine was passed and the clinical condition improved only slightly. The B.P. had fallen to 110/55, and the plasma-Na had risen to 117·5 m.eq. per litre. Electrocardiography showed no abnormality.

Active treatment was started 72 hours postoperatively. 450 ml. of 6% NaCl (containing 480 m.eq. of NaCl) was given intravenously in three divided doses over a period of 9 hours. Definite improvement began after the first dose, and 2 hours after the last infusion the patient was conscious but completely disorientated. The plasma-Na was 127 m.eq. per litre. 13 hours later the plasma-Na had returned to normal as the result of water excretion. The patient's mental condition improved slowly, but 96 hours after the onset he still failed to recognise close relatives, spoke slowly and with difficulty, and answered questions inaccurately. Subsequent recovery was complete. He had no memory of the entire episode.

Case 2.—In this case acute water intoxication was due to an excess of rectal water, aggravated by uncorrected moderate base losses.

The patient, a thin woman aged 51, weighing 53·5 kg. (118 lb.), was in good health apart from gall-stones. There were no notable abnormalities on physical examination. Cholecystectomy was carried out uneventfully. A rectal water infusion was set up. At 24 hours the patient was bright and cheerful. At 30 hours she was noticed to be irrational and uncoöperative. There followed a period of noisy and violent behaviour approaching acute mania, lasting 2 hours, succeeded by flaccid coma lasting 12 hours. We saw the patient at 40 hours. She was comatose and over-breathing; muscle tone and deep reflexes were reduced, and plantar reflexes were flexor. B.P. 130/80 (preoperative 140/80), pulse-rate 68, limbs warm, and peripheral circulation good. The fluid-balance record showed that she had absorbed 7 litres of

TABLE IV—BLOOD AND PLASMA CHEMISTRY, BLOOD-PRESSURE, PULSE-RATE, AND WEIGHT IN CASE 3

Date (1953)	Time	Hb (g. per 100 ml.)	Hæmatocrit (%)	Na (m.eq. per litre)	K (m.eq. per litre)	Cl (m.eq. per litre)	TCO_2 (m.eq. per litre)	N.P.N. (mg. per 100 ml.)	Protein (g. per 100 ml.)	Blood-sugar (mg. per 100 ml.)	B.P. (mm. Hg)	Pulse-rate (per min.)	Weight (kg.)
May 18*	6 hr. postop.	8·0	29	136	3·5	91·5	32·4	..	5·15	165	120/60†	82	55·5 (*122 lb.*)†
May 23	10 A.M.	8·6	29·5	122	2·3	76·5	32·4	38	4·60	155	120/60	84	..
	6 P.M.	..	29·0	142·5	2·3	100·0	30·8	30	4·70	..	150–140/60	104	58·0 (*128 lb.*)
May 24	9 A.M.	8·6	29·0	136	2·1	94·5	30·3	28	4·90	..	140/65	96	..

* Day of 2nd operation. † Preoperative values.
Treatment: first 5 days, parenteral hypotonic fluids; on May 23, 10 A.M.–6 P.M., 1 litre 4% NaCl (680 m.eq. NaCl).

water rectally in 30 hours. She had passed (by catheter) 2500 ml. of urine in 40 hours, at which time the fluid balance was: water +2300 ml., Na −177 m.eq., K −110 m.eq. Acute water intoxication was diagnosed and confirmed by the plasma analysis, showing gross dilution (table III). 250 ml. of 6% saline (260 m.eq. NaCl) was given intravenously in two divided doses separated by 2 hours. Consciousness was rapidly restored; there was a more gradual return of normal cerebral function; and the patient was discharged well 10 days later.

In this patient the uncorrected Na and K losses, mainly urinary, contributed substantially to the hypotonicity.

Case 3.—This patient developed severe water intoxication gradually over a period of 5 days after a relatively small operation.

The patient, a woman aged 68, weighing 55 kg. (121 lb.), was well until the onset of weakness, shortness of breath on exertion, and loss of weight 3 months previously; she had had painless jaundice for several days. The notable abnormalities were gross anæmia (Hb 4·4 g. per 100 ml.) and obstructive jaundice. After repeated blood-transfusions laparotomy was done and numerous stones were removed from a dilated bile-duct, which was drained. No attempt was made to deal with a small carcinoma of the ampulla of Vater, it being decided to postpone further surgery until the patient's condition had improved. She recovered well from the operation, and by the 6th day was taking a light diet and was out of bed. Urine volume was large—up to 3 litres per day—and the water and electrolyte balance was normal. On the 8th day a partial dehiscence of the abdominal wound, with prolapse of some coils of small gut, necessitated resuturing of the wound, which was done under general anæsthesia. Parenteral fluids, including blood and plasma, were given; because of the persistent complaint of thirst a large amount of hypotonic fluid was given parenterally despite the evident positive water balance. On the 5th day after the second operation the patient complained of muscle weakness and sleepiness. Next day these symptoms had progressed to extreme prostration, and she was unable to move except with assistance. She was drowsy, but complained of thirst and drank water avidly. A diagnosis of cholæmia or severe potassium depletion was considered. We saw the patient at this time. The B.P. was at her normal level (120/60), pulse-rate 84, skin warm; central venous pressure was not raised, and there was no hepato-jugular reflux. The muscles were flaccid and the tendon-reflexes absent; plantar responses were flexor. The abdomen was soft and not distended, and peristaltic sounds were heard.

The fluid-balance record showed that the probable balance of water and electrolytes was approximately: water +3–4 litres, Na +50–100 m.eq., K −100 m.eq. The urine volume had been about 1 litre per day since the second operation, except on the 5th day when it was 1500 ml. The specific gravity of the urine was 1·005, and the urine contained no abnormal constituents (Na 10, Cl 15 m.eq. per litre). A diagnosis of water intoxication was made, and this was confirmed by plasma analysis which showed gross hypotonicity (table IV). 4% NaCl was infused slowly into a large vein. After 8 hours 1 litre had been given (680 m.eq. NaCl). The change in her clinical condition was dramatic. She felt well; muscle power was good, and she was able to sit out of bed. The tendon-reflexes were brisk. The plasma-sodium concentration was normal (table IV). The improved clinical condition was maintained for some days and then relapsed owing to hæmatemesis. Death occurred 3 weeks later. Autopsy was refused.

The prolonged failure of one aspect of renal function—osmoregulation—may possibly be attributed to a number of factors, including anæmia, hypoproteinæmia, and jaundice. Adrenal cortical function was judged to be adequate because the level of circulating eosinophils was always low (frequently zero counts were obtained) and because the blood-pressure was well maintained and the urinary sodium excretion low. The persistence of thirst despite water intoxication was a mystifying feature.

Case 4.—This case demonstrates that, although renal function may be good in other respects, the ability to excrete water may be severely restricted.

The patient, a woman aged 88, normally weighing 60 kg. (132 lb.), was in excellent health until the onset of abdominal pain and vomiting 5 days before admission. This was due to gall-stone ileus. She was dehydrated and had severe nitrogen retention (table V) which responded very well to parenteral fluid replacement. A metabolic balance was carried out for the next 7 days, but for technical reasons the details were not known until after an episode of severe water intoxication had occurred. It was not realised that during the first 4 days the patient was progressively retaining water in excess of electrolytes, with consequent hypotonicity. At the end of this time the fluid balance was: water +4800 ml., Na +327 m.eq., K +22 m.eq. Urine volumes of up to 1660 ml. in 24 hours were passed, and the nitrogen retention was rapidly relieved. The lowest urinary specific gravity was 1·004. An operation for the removal of a large gall-stone impacted in the upper ileum was now carried out. During the next 30 hours the fluid balance was water +1200 ml., Na +11 m.eq., K −13 m.eq.; and the progressive fluid balance since the commencement of

TABLE V—BLOOD AND PLASMA CHEMISTRY, BLOOD-PRESSURE, AND PULSE-RATE IN CASE 4

Date (1953)	Hb (g. per 100 ml.)	Hæmatocrit (%)	Na (m.eq. per litre)	K (m.eq. per litre)	Cl (m.eq. per litre)	TCO_2 (m.eq. per litre)	N.P.N. (mg. per 100 ml.)	Protein (g. per 100 ml.)	Blood-sugar (mg. per 100 ml.)	B.P. (mm. Hg)	Pulse-rate (per min.)
July 23*	15·3	46·5	130	3·6	72 0	30·3	197	7·65	..	100/?	..
July 24	13·1	40·0	132	2·5	82·0	34·0	145	6·65	..	..	..
July 25	12·6	39·0	127	3·4	83·0	33·8	70	6·30	..	..	..
July 27†											
July 28‡:											
2 P.M.	11·4	36·0	118	3·9	78·0	30·2	33	5·60	145	100/50	90
5 P.M.	10·7	33·5	133	3·4	95·0	28·8	24	5·10	..	104/48	88
July 31	11·2	34·5	132	3·4	93·5	29·4	18	5·85	..	130/68	78
Aug. 4	..	32·5	135	5·0	95·0	31·1	25	6·40	..	135/75	..

* Date of admission.
† Day of operation.
‡ At 2 P.M. 350 ml. of 6% saline (360 m.eq. NaCl) was given.

treatment was H_2O +6000 ml., Na +338 m.eq., K +9 m.eq. In the 30 hours since the operation 1100 ml. of dilute urine had been passed. But at this time the patient had severe symptoms of water intoxication, including extreme prostration, weakness, drowsiness, and disorientation. The tendon-reflexes, previously brisk, were absent. Blood analysis showed severe hypotonicity (table V, July 28). Treatment with 350 ml. of 6% saline intravenously (360 m.eq. NaCl) was given, and within 3 hours the patient's clinical condition had much improved, and thenceforth she made an uninterrupted recovery.

Case 5.—This patient had severe water intoxication postoperatively, and antidiuretic factors acted for 12 days after the operation.

The patient, a woman aged 70, weighing 43 kg. (95 lb.), had undergone partial pancreatectomy for carcinoma of the head of the pancreas causing obstructive jaundice. A persistent partial obstruction of the gastro-enterostomy stoma necessitated continuous parenteral-fluid therapy, which included 2400 ml. of blood, rectal water, and glucose-saline (0·18% NaCl, 4·3% glucose) infusions. On the 7th day she became increasingly weak and lethargic, and by the 9th day prostration was extreme and she could move only with difficulty because of weakness. She was disorientated, irrational, and alternatively noisy or very drowsy. We saw the patient on this day. The

TABLE VI—BLOOD AND PLASMA CHEMISTRY, BLOOD-PRESSURE, AND PULSE-RATE IN CASE 5

Postop. days	Hb (g. per 100 ml.)	Haematocrit (%)	Na (m.eq. per litre)	K (m.eq. per litre)	Cl (m.eq. per litre)	TCO_2 (m.eq. per litre)	N.P.N. (mg. per 100 ml.)	Protein (g. per 100 ml.)	Blood-sugar (mg. per 100 ml.)	B.P. (mm. Hg)	Pulse-rate (per min.)
9	11·0	39·5	107	3·4	68·0	28·6	38	5·50*	105	120/60	84
10	11·4	37·0	120	2·9	80·0	28·3	36	5·46	..	140/60	82
11	..	..	118	2·1	80·5	26·7	31	5·14	..	145/60	82
12	10·8	35·5	125	3·2	85·0	29·9	23	5·10	96	150/60	..
13	10·2	35·0	129	3·3	93·0	24·9	20	4·93	..	135/65	..

* Normal A/G ratio.

skin was warm and the tissue turgor normal; the blood-pressure was normal (120/60) and pulse slow (84); central venous pressure was normal; there was no hepatojugular reflux; the muscles were flaccid, and the tendon reflexes, previously noted to be brisk, were now absent. The fluid-balance record indicated that there was probably a positive water balance of some 3 litres, and a moderately negative Na and K balance (about 150 m.eq. of each). This assessment was supported by the subsequent metabolic history. Water intoxication was diagnosed and confirmed by the blood analysis (plasma-Na 107 m.eq. per litre, table VI). The urine output since the operation had been about 700 ml. per 24 hours, except on two occasions when more than 1500 ml. had been passed. Treatment by water restriction and hypertonic saline infusions was given. Within 24 hours the symptoms were relieved. The plasma-Na was now 120 m.eq. per litre.

2 days later the patient was well, and the plasma-Na was 125 m.eq. per litre. The fluid balance from the start of treatment for water intoxication was: H_2O −500 ml., Na +572 m.eq., K −16 m.eq. Diuresis did not occur, however, the largest 24-hour urine volume being 900 ml. There was considerable dependent œdema, owing to the transfer of water from the cells to the E.C.F. Subsequently the patient made an uninterrupted recovery, the plasma-Na becoming stable at a low normal level (133 m.eq. per litre).

TABLE VII—BLOOD AND PLASMA CHEMISTRY, BLOOD-PRESSURE, AND WEIGHT IN CASE 6

Date (1953)	Hb (g. per 100 ml.)	Na (m. eq. per litre)	K (m. eq. per litre)	Cl (m. eq. per litre)	TCO_2 (m. eq. per litre)	N.P.N. (mg. per 100 ml.)	Protein (g. per 100 ml.)	Blood-sugar (mg. per 100 ml.)	B.P. (mm. Hg)	Weight (kg.)
Feb. 17 (preop.)	14·1	140	4·8	101·0	..	28	6·9*	..	160/90	51·0 (*112 lb.*)
Feb. 22	13·9	117	4·9	76·0	28·6	48	6·0	135	120/65	53·2 (*117 lb.*)
Feb. 23	..	122	4·8	84·0	27·1	42	5·8	..	..	..
Feb. 25	13·4	125	3·1	85·0	26·8	32	5·5	118	130/70	53·0 (*117 lb.*)
Feb. 27	13·4	128	4·2	90·0	26·9	31	5·7	..	125/70	..
Mar. 1	13·1	135	4·7	95·0	28·2	31	5·8	..	145/85	..
Mar. 4	..	135	4·5	95·5	27·7	26	5·6	..	115/60	49·1 (*108 lb.*)
Mar. 10	13·4	127	4·3	89·0	29·4	26	5·9	..	150/90	47·0 (*103 lb.*)
Mar. 14	13·8	128	4·3	89·5	29·0	24	6·0	..	150/90	46·0 (*101 lb.*)
Mar. 23†	13·4	126	4·4	89·0	26·8	18	5·9	..	130/70	44·5 (*98 lb.*)
April 1‡	13·4	129	3·4	91·0	28·0	..	..	..	155/75	43·5 (*96 lb.*)
April 9	13·6	127	4·7	89·0	29·0	23	6·3	..	..	43·0 (*95 lb.*)
May 9	13·7	127	3·5	91·0	27·0	16	6·1	..	..	45·3 (*100 lb.*)
June 10	12·9	128	4·3	91·0	26·5	20	5·6	..	..	..

* Normal A/G ratio.
† H_2O excretion test.
‡ After 5 days of cortisone therapy.

In this patient the extreme hypotonicity was due to water retention aggravated by moderate Na and K depletion. The cause of the prolonged failure of osmoregulation was not known.

Case 6.—This case provides an opportunity to compare water intoxication with symptomless hypotonicity.

The patient, a man aged 65, weighing 51 kg. (112 lb.), had recently begun to have mild dyspepsia and weight loss. There were no physical abnormalities, but there was radiographic evidence of a gastric neoplasm. Blood chemistry was normal (table VII). Total gastrectomy, splenectomy, and partial pancreatectomy were done. The immediate postoperative recovery was uneventful. He was maintained on parenteral fluids, including 1200 ml. of blood, rectal water, and glucose-saline (0·18% NaCl, 4·3% glucose) infusions. On the 5th postoperative day he complained of weakness and was drowsy. These symptoms progressed and were pronounced when we saw the patient on the 6th day. The fluid-balance chart suggested that the water balance was approximately +3 litres (Na O, K −150 m.eq.); and his weight, 53·2 kg., was compatible with this. Water intoxication was diagnosed and confirmed by the plasma analysis (table VII). In 5 days the urine output had been 4500 ml., the last 24-hour urine volume being 1100 ml. During the next 3 days the water and electrolyte balance was: water +480 ml., Na +484 m.eq., K −37 m.eq. His symptoms were completely relieved. His plasma-Na was now 125 m.eq. per litre. Despite this hypotonicity his 24-hour urine volume was only 1240 ml. During the course of the next 7 days, while he was on a restricted water and electrolyte intake, his body-weight fell and his plasma-Na returned to normal (135 m.eq. per litre) owing to the gradual excretion of excess water. A week later his plasma-Na was much lower than normal (127 m.eq. per litre), and it did not vary significantly from this figure during the subsequent 4 months (table VII). For most of this time he felt well, but wasting was progressive and finally he died of bronchopneumonia. Two short metabolic studies 3 months before death showed that the water and electrolyte balance was normal. Water restriction, added dietary salt and potassium, and large doses of cortisone had no effect on the hypotonicity. The diuretic mechanisms were permanently impaired, and he excreted only 20% of a water load (Kepler test) in 4 hours; this was unaffected by cortisone.

The first episode of hypotonicity was due to excessive water retention and it responded to treatment. The cause of the prolonged failure of osmoregulation, even 8 days after the operation, was obscure. The second episode of hypotonicity, which lasted until the patient's death, is a typical example of "symptomless hypotonicity."

Prevention

If the intake of water corresponds to that lost, then water intoxication will not occur. Water lost in the urine and alimentary secretions usually can be collected and measured; but that lost in sweat, insensible perspiration, and the expired air cannot. These insensible losses may amount to as little as 800 ml. per 24 hours in a man weighing 60 kg., and at least this amount must be added to the measured losses in calculating the total fluid output. The importance of accurate ward measurements and records cannot be over-emphasised. In a difficult case the water balance can be more surely assessed by weighing the patient, since changes in weight over short periods almost entirely depend on changes in body-water content. Biochemical analyses, especially the plasma-Na concentration, are also an important aid in assessing progress and regulating treatment. Base losses must be adequately replaced since they act with water retention to cause hypotonicity. Furthermore, the possibility must be considered that there is reduced ability to excrete water, even in the absence of renal disease.

Treatment

The cause of the symptoms in water intoxication is probably over-hydration of the cells. To correct this,

restricted water intake is essential. In mild cases urine excretion and insensible water loss will soon correct the abnormal hypotonicity. In patients requiring more urgent treatment hypertonic saline is effective and safe. But the diagnosis must be certain. 6% saline provides a little more than 1 m.eq. of NaCl per ml. of solution. The amount of NaCl to be given can be calculated, roughly, as follows: allow total body-water = 60% of body-weight = x litres; then to raise plasma-Na by 10 m.eq. give $10x$ m.eq. of NaCl. Thus in a patient weighing 60 kg., $x = 36$ litres and 360 m.eq. of NaCl (350 ml. of 6% NaCl) will raise the plasma-Na concentration by roughly 10 m.eq. per litre. This is as much as need be given in most cases, and this amount should not be exceeded unless there are definite indications for doing so. It is probably safest to inject the solution in amounts of up to 100 ml., taking some minutes over each injection and allowing $^1/_2$ hour for osmotic equilibrium to be reached before proceeding with further injections. As a precaution against venous thrombosis at the site of injection, rapid venous flow should be ensured by heating the hand and arm to 50°C.

An alternative method is to give hypertonic-glucose (50%) injections to shrink the cells, but we have no personal experience with this method (Ariel 1951).

It is important to recognise the ineffectiveness and potential danger of treating water intoxication by isotonic saline infusions. Isotonic saline is effective in sodium depletion because it rapidly corrects the reduced plasma and E.C.F. volume. This restores renal function and osmoregulation returns. In water intoxication the E.C.F. volume is already increased. Isotonic saline infusions will increase it further, and will not to any extent increase the plasma-Na concentration or dehydrate the cells; renal function is not improved, and there is a danger of cardiac failure and pulmonary œdema.

In chronic water intoxication the response to treatment is dramatic. In acute water intoxication consciousness can soon be restored and the danger of further epileptic attacks averted. Return of cerebral function may be more gradual, but full recovery can be expected.

Conclusions

Water intoxication is not uncommon; its frequency is increasing with the wider administration of parenteral hypotonic fluid. In many conditions, but especially after operations, the kidney's ability to excrete water may be reduced. In postoperative cases this abnormality does not usually last more than about 36 hours, but sometimes it persists much longer. Because there may be no other evidence of renal failure, it is unlikely that this prolonged failure of osmoregulation is primarily a renal disturbance, but its cause is unknown.

If water is retained without an equivalent amount of electrolytes, the body-fluids become diluted. When water is being retained base losses, which may be only moderate and, in other circumstances, of negligible clinical importance, seriously aggravate hypotonicity. Except in hyperglycæmia, the plasma-Na concentration reliably measures the effective osmotic pressure of the E.C.F. In water intoxication the plasma-Na concentration is always low. For this reason water intoxication is sometimes mistaken for Na depletion. But it differs from this condition in many ways, and especially in that Na depletion may play no part, or only a minor one, in the hypotonicity, and there is no dehydration, hæmoconcentration, weight loss, or urea retention. A third condition—symptomless hypotonicity—also enters into the differential diagnosis of the hypotonic syndromes. It is an incidental finding in a seriously ill patient, and is not caused by either water retention or Na depletion; it resists treatment.

The amount of excess water necessary to produce symptoms varies between one patient and another. It may be dangerous to exceed a 10% lowering of the osmotic pressure; and the amount of water necessary to cause this can be calculated, roughly, from the body-weight, allowance being made for the coincident base balance. Water given by rectum, widely believed to be a safe route, figures prominently as a cause of water intoxication in our cases.

Water intoxication is often not recognised: one reason is that it does not produce such evident signs as generalised or pulmonary œdema, and at necropsy no special lesion may be found. In acute cases the symptoms are those of a severe cerebral disorder and often an intracranial lesion is diagnosed at first. In the gradually produced condition the symptoms are more insidious, but they may lead to extreme prostration and muscle weakness. The symptoms resemble those of many other illnesses, and for this reason the diagnosis is likely to be overlooked. Water intoxication is preventable, but when it has developed treatment gives highly satisfactory results.

Summary

After surgical operations patients are not uncommonly given more water than their kidneys can excrete.

Water retained without electrolytes lowers the osmotic pressure of the body-fluids and may cause severe symptoms.

Because the plasma-Na concentration is always low in water intoxication, this is sometimes mistaken for Na depletion. It is important to distinguish between these two conditions because the treatment is different.

Water intoxication can be prevented by careful management of the fluid balance.

Treatment by water restriction, and in severe cases infusion of hypertonic saline, is effective and safe.

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COMBINED CORTICOTROPHIN THERAPY AND CHEMOTHERAPY IN PULMONARY TUBERCULOSIS

WITH SPECIAL REFERENCE TO HYPERSENSITIVE REACTIONS

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CORTICOTROPHIN and cortisone have been shown to exert a deleterious effect on the progress of tuberculosis in various animal species (Cummings and Bloom 1950, Hart and Rees 1950, Spain and Molomut 1950). This is supposed to be due to the suppression of the normal inflammatory response to infection, inhibition of granulation tissue and fibroplasia, and suppression of the beneficial lymphocytic response. Tubercle bacilli are thus enabled to multiply and to invade the non-reacting tissues without any attempt at limitation or repair. These facts, together with the reports of reactivation of latent tuberculosis in man when either corticotrophin or cortisone has been used for other reasons, appeared to contra-indicate their use in active tuberculosis (Fred et al. 1951, Gold 1952, Harris-Jones and Pein 1952, King et al. 1951, Kleinschmidt and Johnston 1951, Popp et al. 1951, Walker 1952). Cortisone and corticotrophin have, in fact, been proscribed in the presence of tuberculosis by the American Trudeau Society. On theoretical grounds, however, there seems to be an advantage in suppressing adverse tissue reactions in the presence of an effective antibiotic. These considerations are referred to below.

Effect of Corticotrophin on Allergic Reactions

In 1951 case 1 (see below), a woman, aged 37, with widespread and rapidly deteriorating tuberculosis of the lungs, was hypersensitive to both streptomycin and P.A.S., severe reactions, including hepatitis, were produced whenever an attempt was made to use these drugs. She was also hypersensitive to thiosemicarbazone. At that time desensitisation by graded dosage had not been widely used, and the simultaneous development of hypersensitivity to both drugs made this more difficult. Time was also an important factor in this rapidly deteriorating case. In view of the success which had been reported (Carey et al. 1950, Hensler et al. 1952) in mitigating the symptoms of reactions to penicillin and other drugs with corticotrophin and cortisone, it was thought justifiable to use corticotrophin in combination with streptomycin and P.A.S. to overcome such reactions; but in this instance it would be necessary to continue to administer the drugs to which the patient was hypersensitive for weeks together with corticotrophin. This treatment was successfully given. In combination with corticotrophin the course of chemotherapy was resumed without incident, and on withdrawal of the corticotrophin the patient had lost her hypersensitive reaction. The pulmonary lesions retrogressed, and no relapse occurred on withdrawal of the corticotrophin. This case has previously been reported (see *Tubercle* 1951, *British Medical Journal* 1951).

Similar effects have been obtained in other patients, many of whom have been followed up for a long time.

The clinical history of 21 tuberculous patients treated with corticotrophin in combination with streptomycin and P.A.S. is summarised below. In 2 cases with drug allergy symptoms returned after the withdrawal of corticotrophin, and chemotherapy had then to be stopped.

But all the patients were able to have a full course of chemotherapy while corticotrophin was being given. 5 patients had not exhibited hypersensitive reactions but were accepted for treatment because of nausea and gastro-intestinal symptoms. In 3 other patients corticotrophin was used to control the symptoms when severe hypersensitive reactions had already developed. In 5 other cases corticotrophin was used although there were no symptoms of drug intolerance. The youngest patient was a girl, aged 12 years, with miliary tuberculosis who had severe hypersensitivity to streptomycin and in whom an attempt at desensitisation was unsuccessful. The oldest was a woman aged 60. Some of these cases have been reported previously (see *British Medical Journal* 1951).

Dosage

Procedure varied somewhat from case to case, but an average scheme of dosage of corticotrophin was as follows: 80 mg. daily for four days, 60 mg. daily for three days, 40 mg. daily for three weeks, 20 mg. daily for two weeks, and then 10 mg. daily for a week or longer. The daily dosage was divided into four equal injections given at 8 A.M., NOON, 4 P.M., and 8 P.M. In one or two patients who had had severe drug reactions slight symptoms began to emerge when the dosage was reduced to 20 mg. a day. In other patients, however, a maintenance dosage of 10 mg. was sufficient to control all the symptoms. In 3 patients with gastro-intestinal intolerance 2·5 mg. twice a day was a sufficient maintenance dose; the symptoms returned on withdrawal of this minute dosage; they were not suppressed by injections of sterile water, but symptoms of nausea were again controlled when the daily dosage of 5 mg. was restored. It seems probable, therefore, that a very small maintenance dose is often sufficient to control nausea and gastro-intestinal symptoms. The impression has been gained that, in patients with active pulmonary tuberculosis, relatively small doses of corticotrophin are sufficient to produce a perceptible clinical response.

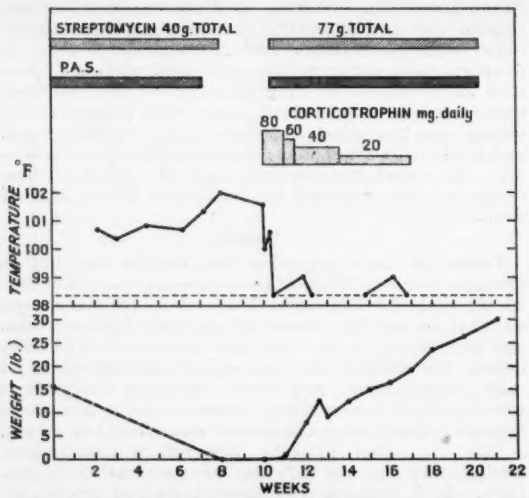
Effect of Corticotrophin and Chemotherapy on Radiological Appearances

All the patients had extensive active tuberculosis. In no case was the disease made radiographically worse. In some cases there was considerable, even vital, improvement during and after corticotrophin treatment. It had originally been supposed that corticotrophin exerted a fibrolytic action on established scar tissue, but this is not so. Thus old-standing lesions remained substantially unchanged radiographically. But reversible lesions showed improvement, and recent infiltrations were cleared effectively. This effect was doubtless due primarily to streptomycin. But in some cases streptomycin had previously not produced a good response. It therefore seemed that the streptomycin effect on active tuberculous lesions, judged radiographically, was enhanced by treatment with corticotrophin in some cases.

Clinical Effect of Combined Corticotrophin Therapy and Chemotherapy

In most of the cases there was an immediate and pronounced clinical improvement. At once the patient's temperature settled, cough and sputum diminished, appetite returned, and all toxic symptoms disappeared. Euphoria took the place of depression. Weight rapidly increased—and not by fluid retention alone, because the weight was maintained after withdrawal of the corticotrophin. Several patients gained 30 lb. in three months, although the corticotrophin was administered for only six to eight weeks (see figure).

These clinical effects have previously been observed when either corticotrophin or cortisone has been given alone in advanced pulmonary tuberculosis (Lemaistre et al. 1951), but relapse followed the withdrawal of the hormone. Relapse has not been observed in any case in the present series on the withdrawal of corticotrophin in combination with streptomycin and P.A.S. Several patients underwent operations, and their wounds healed without difficulty.



Effect of corticotrophin therapy on a man, aged 48, with very extensive pulmonary tuberculosis. Clinical and radiographic deterioration took place on treatment with streptomycin and P.A.S. alone, with steady loss of weight and continued pyrexia. A short course of corticotrophin reversed the clinical picture.

Clinical Material

Detailed clinical radiographic or pathological findings are not given in the following case summaries. It was ascertained in each case that bacterial resistance had not developed at the time of corticotrophin therapy. A preliminary decrease in the number of eosinophils was noted after a test dose of corticotrophin before drugs were given to which the patient was known to be hypersensitive. In some cases the urinary excretion of 17-ketosteroids and eosinophil-counts were made daily, but they did not prove helpful.

Case 1.—A woman, aged 37, had extensive bilateral pulmonary tuberculosis with gross cavitation. Her condition had steadily deteriorated in the twelve months since diagnosis. She had had severe hypersensitive reactions, including jaundice, to streptomycin, P.A.S., and thiosemicarbazone. Her cough was becoming intractable, with 4 oz. daily of sputum containing tubercle bacilli; she was losing weight and unable to eat. Her general condition was very poor, with pronounced mental depression. The erythrocyte-sedimentation rate (E.S.R.) fluctuated between 36 and 50 mm. in one hour (Westergren).

Treatment.—She was given corticotrophin 80 mg. for four days and then began a course of streptomycin and P.A.S. with corticotrophin at the same dosage. Because it was thought that only a short intensive course of chemotherapy would be feasible, the initial dose of streptomycin was 4 g. daily. Five days later a faint rash appeared, and the dose of streptomycin was reduced to 1 g. daily and that of corticotrophin increased to 120 mg. daily. The rash was accompanied by an increased eosinophil-count but no constitutional disturbance. The rash quickly faded, and the dosage of corticotrophin was reduced to 80 mg. daily, and after three days to 40 mg. daily. This régime was continued for thirty-six days, when the dosage of corticotrophin was reduced to 10 mg. daily, and after seven days more to 5 mg. daily. A total of 3375 mg. of corticotrophin was given. After a short interval treatment with streptomycin and P.A.S. was restarted without corticotrophin and was tolerated without any hypersensitive response.

Clinical Progress.—This was satisfactory in every way after the first dose of corticotrophin. Almost overnight the patient began to eat and to take an interest in life. She looked and felt well. Her cough almost ceased, and her sputum was reduced from 4 oz. daily to a trace. Her weight rose steadily from 9 st. 6 lb. to 11 st. Some of the initial weight increase was no doubt due to fluid retention, but the improvement continued steadily after corticotrophin therapy had been discontinued. The sputum, which initially contained many tubercle bacilli on direct smear, had become negative on culture four months later. There was considerable radiographic improvement, and the patient subsequently underwent a left artificial pneumothorax and right thoracoplasty. Her lungs had been very extensively damaged, however, before the tuberculosis was arrested, and the thoracoplasty did not achieve complete closure of the residual cavity. The artificial pneumothorax was also imperfect. Nevertheless she remained well for two years.

Cases 2, 4, 8, 9, 12, 14, and 17 all had extensive pulmonary tuberculosis, deteriorating clinically, and were hypersensitive to either streptomycin or P.A.S., or both. All tolerated chemotherapy normally in combination with corticotrophin. 6 of them had lost their drug hypersensitivity on withdrawal of the corticotrophin; 2 remained hypersensitive, but these had received corticotrophin for only four weeks. All showed very obvious clinical improvement. There was slight or moderate radiographic improvement in extensive long-standing lesions. Fresh lesions cleared well. No retrogression was observed after withdrawal of the corticotrophin.

Case 3.—A girl, aged 15, with extensive bilateral bronchopneumonic lesions, was deteriorating clinically and radiographically in spite of six weeks' treatment with streptomycin and P.A.S. daily. She was intolerant of, but not hypersensitive to, P.A.S. Corticotrophin 1370 mg. was given in seven weeks, in combination daily with streptomycin and P.A.S., which were tolerated well with corticotrophin; but vomiting and diarrhœa developed on withdrawal of the maintenance dose of corticotrophin 5 mg. daily. Symptoms were not controlled by injections of distilled water but were controlled when corticotrophin was given again in a dosage of 5 mg. daily. There was very much clinical and radiographic improvement. The patient underwent a successful left plombage. Period of follow-up: two years.

Cases 7, 11, 13, and 16 were similarly treated for intolerance to P.A.S. This intolerance was controlled in each case, and clinical and radiographic improvement was satisfactory and maintained, but P.A.S. intolerance returned after the withdrawal of corticotrophin.

Case 6.—A girl, aged 14, had acute widespread bilateral tuberculous bronchopneumonic lesions. Streptomycin 1 g. daily with P.A.S. was given for three months. Moderate radiographic clearing occurred, and there was some clinical improvement. Towards the end of the three-month course there was some evidence of clinical deterioration, with raised E.S.R. and loss of weight. Radiographic improvement was considered unsatisfactory. A further three months' treatment with streptomycin and P.A.S. daily, with the addition of corticotrophin for six weeks, initiated considerable radiographic clearing and clinical improvement. A small residual cavity in the left apex was successfully controlled by pneumothorax. Period of follow-up: twenty-one months.

Cases 15, 18, 20, and 21, all with extensive intractable tuberculous lesions but neither hypersensitive to nor intolerant of chemotherapy, were given corticotrophin in combination with streptomycin and P.A.S. All showed much clinical and moderate radiographic improvement, which was maintained after the withdrawal of corticotrophin.

Case 19.—A student nurse, aged 30, with a limited tuberculous lesion in the left lung, was put on a course of streptomycin and P.A.S. After fourteen days she developed a rash on her abdomen which was not affected by anti-histamines. Seven days later the rash had spread over her body and she developed œdema of the face and vomiting. All drugs were stopped. Two days later she had a fit and subsequently became unconscious and remained so for two days. Anticonvulsants and anti-histamines were given without effect. She had 5200 white cells per c.mm. Her cerebrospinal fluid was normal. It was considered that the findings were consistent with cerebral œdema of allergic origin.

Treatment.—Corticotrophin 80 mg. daily in four equal doses was started at 4 P.M., and next day the patient had regained consciousness and her general condition was much improved. The dosage of corticotrophin was then reduced to 20 mg. daily. Twenty-four hours later there had been

further great improvement and the patient was normal except for retrograde amnesia. Corticotrophin was withdrawn the following day, 300 mg. having been given.

Progress.—The patient then began to complain of headache and some dizziness, but there was no return of serious symptoms. Amnesia continued for some weeks, but after three months her memory returned. She still had a positive Romberg sign, extensor plantar reflexes, and slight nystagmus. Caloric tests were negative. No further attempts were made to institute chemotherapy in this case, and it is not known whether streptomycin or P.A.S. was responsible for the reaction. Skin sensitivity tests were not helpful.

A similar case has been reported by Marsh (1952).

Cases 5 and 10 were successfully treated for the symptoms of severe P.A.S. reactions.

Discussion and Conclusion

Corticotrophin and cortisone have been shown to be effective in suppressing the symptoms of the delayed type of allergic reaction in various conditions, and these effects have been well summarised by Pickering (1952). An interesting feature of the present series was that the patients, under the protection of a very small maintenance dose of corticotrophin, could tolerate the continuous administration of drugs which had previously produced violent reactions. At the end of six or eight weeks on this régime 6 of 8 patients had lost their allergy. A case of allergy to aspirin (Carey et al. 1950) is interesting because several small doses of aspirin were given without response while the patient was under the influence of corticotrophin, and on withdrawal of the hormone the patient had lost his allergy. It seems possible that desensitisation by the conventional method of graded dosage may be facilitated by corticotrophin.

It seems probable that corticotrophin and cortisone may each have a definite value in emergencies arising from a severe drug reaction, as in case 19.

The suppression of the nausea and gastro-enteritis provoked by P.A.S. by a very small maintenance dosage of corticotrophin no doubt depends on the ability of the hormone to depress inflammatory responses regardless of their ætiology. Symptoms returned if the corticotrophin was withdrawn but not if the P.A.S. was withdrawn at the same time.

The adrenal cortex plays an important part in resistance to infection, and adrenalectomised animals are known to be much more susceptible than normal animals to infections and toxic agents both chemical and biological. On the other hand, stress, which is so commonly a precipitating cause of tuberculous breakdown, is presumably associated with increased adrenal activity. This could well be used as an argument that stimulation of the adrenal cortex leading to increased cortisone production is deleterious in tuberculosis.

The corticosteroids are known to modify the tuberculin reaction in man and animals. The tuberculin reaction and the Koch phenomenon of accelerated inflammatory response to the presence of tubercle bacilli have been interpreted by Krause and Willis (1926) as defensive, and by Rich (1946) as injurious, aspects of the acute inflammatory reaction in tuberculosis. Tuberculin is used by some deliberately to provoke the focal inflammatory reaction, which (they believe) may hasten reabsorption or encapsulation of the tuberculous lesion, whereas others have used small doses of tuberculin with a view to desensitisation. One had hoped, with Thorn et al. (1950), that corticotrophin or cortisone "might dissociate the harmful effects of hypersensitivity from the beneficial reactions of immunity."

In progressive pulmonary tuberculosis the clinical picture which emerges is the result of the accelerated inflammatory response to the tubercle bacillus. Fever and other toxic phenomena, tissue necrosis, granulation tissue, and fibrosis are all manifestations of infection in a hypersensitive person. They represent an overactive defence mechanism, which, if the patient survives, often leaves him with irreversible bronchopulmonary damage. The suppression of this defence mechanism, with the consequent failure to encapsulate the bacilli or to interfere with their freedom of movement through the tissues, may well facilitate the action of streptomycin in the localised forms of tuberculosis found in man. Spain and Molomut (1950) found that cortisone decreased the effect of streptomycin in guineapigs, but the progress of experimental tuberculosis in these animals is not comparable with that of the natural disease in man. It has been suggested that streptomycin increases the fibrosis in the lungs and bronchi. If this reaction were modified, and the elimination of bacilli were at the same time not impeded, there would be an indication for supplementing chemotherapy with corticotrophin in early lesions.

The effect of cortisone on the development of immunity to tuberculosis in guineapigs has been studied by me and Dr. D. Davies (Houghton and Davies 1954). The results do not suggest that immunity is impeded by cortisone.

From the very cautious clinical investigation made during the past two and a half years it seems justifiable to draw two conclusions, one definite and the other tentative. It appears that corticotrophin controls the manifestations of hypersensitivity to streptomycin and P.A.S. and enables effective courses of these drugs to be given in an otherwise intolerant patient.

The tentative conclusion is that corticotrophin, given in the dosage suggested in combination with streptomycin and P.A.S., is safe in pulmonary tuberculosis. There is some evidence that corticotrophin enhances the effect of chemotherapy as demonstrated radiographically, and there is no doubt that it often revolutionises the clinical condition of the dispirited and toxic patient. We suggest that it is now justifiable to use this combination of agents in some more promising cases with early lesions, particularly where the patients are not hypersensitive reactors to chemotherapy and can therefore be given streptomycin without the limitations imposed in most of the cases in the present series.

Summary

21 patients with active pulmonary tuberculosis were given corticotrophin in combination with streptomycin and P.A.S. 8 of them were known to have an acquired hypersensitivity to one or both of these drugs. The corticotrophin suppressed all the reactions during a standard course of chemotherapy. On withdrawal of the corticotrophin 6 of the 8 patients had lost their hypersensitivity.

5 of the 21 patients had gastro-intestinal intolerance to P.A.S., and this was suppressed by a very small maintenance dosage of corticotrophin.

5 patients were given corticotrophin in combination with streptomycin and P.A.S. in the absence of hypersensitivity.

3 patients who developed alarming hypersensitive reactions derived immediate benefit from corticotrophin.

No adverse clinical or radiographic effects were seen either during corticotrophin therapy or after its withdrawal for periods of up to two years.

On combined corticotrophin therapy and chemotherapy severely ill patients improved very much and the progress was maintained after the withdrawal of corticotrophin. Clinical and radiographic improvement was noted in patients who had not previously responded well to streptomycin and P.A.S. alone.

Most of the patients in this series were referred to me by colleagues in the chest clinics, particularly the Ealing Clinic; I wish to thank them and the doctors and nurses at Harefield Hospital for their valuable coöperation, and Miss H. P. Bennett for much help with clinical records. Messrs. Organon Ltd. supplied the corticotrophin.

References overleaf

RESULT OF VAGOTOMY IN TREATMENT OF ANASTOMOTIC ULCER *

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THIS clinical investigation was undertaken to assess the results of vagotomy used as the sole method of treatment for anastomotic ulceration following partial gastrectomy or gastro-enterostomy. The term anastomotic ulceration is here used in the broad sense to include peptic ulceration in the vicinity of the anastomosis. To obtain as objective a conclusion as possible, certain criteria for the acceptance of cases were laid down. Since the number of cases in any one hospital is bound to be small, the net was cast widely, and these cases were collected from eight hospitals in the London area at which a special interest in gastric surgery exists. All cases of anastomotic ulceration treated by vagotomy at these hospitals were reviewed, and apart from the criteria mentioned below there was no selection of cases.

Diagnostic Criteria

Cases were accepted if they satisfied one or more of the criteria mentioned below, and it was considered that only cases in which the diagnosis of an anastomotic ulcer had been established beyond all reasonable doubt should be included. 39 such cases were found. The cases were traced from the disease indices of hospitals visited, and 120 case-reports with the diagnosis of anastomotic ulceration and vagotomy were collected. Of the 81 patients not included 37 had had the vagotomy done less than two years before, 14 had had other operations in addition to vagotomy, 21 did not fulfil the criteria for diagnosis of anastomotic ulceration, and 9 were not traced.

The criteria were as follows:

(1) *Irrefutable Findings at Operation.*—Many operation notes contain such statements as "Dense adhesions around anastomosis—? ulcer felt." Unless there has been other more positive evidence of ulceration, such cases have been excluded.

(2) *Gastroscopy.*—Definite recognition of the ulcer by gastroscopy.

(3) *Perforation.*

(4) *Hæmorrhage.*—Moderate hæmatemesis or melæna was taken as strong evidence of anastomotic ulceration, but in all such cases there was other evidence—radiological, gastroscopic, or surgical—to confirm the diagnosis.

(5) *Gastrojejunocolic Fistula.*

(6) *Radiography.*—In view of the accepted difficulties of accurate radiographic diagnosis of anastomotic ulceration, many cases were discarded where no other confirmatory evidence existed and a review of the radiographs led to doubt. In only 3 cases was radiological diagnosis accepted as the only criterion of anastomotic ulceration. These films were reviewed, and the diagnosis was considered certain.

No case was accepted in which the follow-up period since vagotomy was less than two years, unless there had been a recurrence before then. By the adoption of these strict criteria the number of cases was greatly reduced, but a more objective conclusion can be drawn from this series thereby. The 39 cases thus selected have been personally seen, clinically examined, in many cases investigated further, and assessed as regards the result.

Assessment of Results

The reviewed cases were graded as follows:

A, clinically free from all signs and symptoms of ulceration, and no evidence of ulceration found on investigation.

B, clinically there is a suspicion of recurrent ulceration, such as recurrence of ulcer type of pain, hæmatemesis, or melæna; but confirmatory evidence, as outlined in the criteria used for diagnosis of anastomotic ulceration, is lacking. This group does not include patients who still complain of symptoms referable to the original operation—e.g., regurgitation of bile, and dumping after partial gastrectomy.

C, positive evidence of recurrence.

Findings

These will be considered in two groups: (1) anastomotic ulceration following partial gastrectomy; and (2) anastomotic ulceration following gastro-enterostomy.

AFTER PARTIAL GASTRECTOMY

There are 25 patients in group 1, and the details are shown in table I. All these patients had undergone partial gastrectomy for duodenal ulcer except 2 who had gastric ulcer; 24 were male and 1 female.

Brief details of 3 grade-C results are worth noting, as follows:

Case 1.—A man, aged 41, had a perforated duodenal ulcer in 1936, and again in 1941. This second perforation was followed a few months later by gastro-enterostomy, and

TABLE I—PATIENTS WHO UNDERWENT PARTIAL GASTRECTOMY

Age at vagotomy (yr.)	No. of patients	Group		
		A	B	C
30–40	8	3	4	1
41–50	8	6	2	0
51–60	7	4	1	2
More than 60 ..	2	2	0	0
Total ..	25	15	7	3

Time from operation to onset of symptoms of anastomotic ulcer (yr.)	No. of patients	Group		
		A	B	C
Less than 1 ..	11	7	4	0
1–2	6	4	1	1
2–4	6	3	2	1
More than 4 ..	2	1	0	1
Total ..	25	15	7	3

Duration of follow-up (yr.)	Time from vagotomy to recurrence of symptoms (yr.)			No recurrence
	Less than 1	1–2	2–4	
2–3	6*	0	0	9
3–4	0	0	3	1
4–6	1	0	0	4
More than 6 ..	0	0	0	1
Total ..	7	0	3	15

* Includes 3 cases with proved recurrence.

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TABLE II—PATIENTS WHO UNDERWENT GASTRO-ENTEROSTOMY

Age at vagotomy (yr.)	No. of patients	Group		
		A	B	C
30–40	3	1	1	1
41–50	3	1	1	1
51–60	4	1	0	3
More than 60 ..	4	1	1	2
Total ..	14	4	3	7

Time from operation to onset of symptoms of anastomotic ulcer (yr.)	No. of patients	Group		
		A	B	C
Less than 1 ..	8	4	2	2
1–2	3	0	0	3
2–4	0	0	0	0
More than 4 ..	3	0	1	2
Total ..	14	4	3	7

Duration of follow-up (yr.)	Time from vagotomy to recurrence of symptoms (yr.)				No recurrence
	Less than 1	1–2	2–4	More than 4	
2–3	2	0	0	0	0
3–4	1	0	0	0	1
4–6	3	0	0	1	2
More than 6 ..	1	1	1	0	1
Total ..	7	1	1	1	4

shortly after this a further perforated ulcer (site not specified). In 1943 a Polya-type gastrectomy was done. In 1945 the symptoms recurred. In 1948 there was a hæmatemesis, and radiography and gastroscopy revealed an anastomotic ulcer. In July, 1949, the patient underwent transthoracic vagotomy. An insulin test-meal three months later showed no hydrochloric acid. In April, 1951, there was another hæmatemesis, and gastroscopy revealed an ulcer just above the stoma. In January, 1952, there was yet another hæmatemesis.

Case 2.—A man, aged 51, who had had recurrent hæmatemesis from a duodenal ulcer since 1938, underwent a Polya-type gastrectomy in February, 1949. In March, 1950, he had a hæmatemesis, and radiography revealed an anastomotic ulcer. In October, 1950, the patient underwent transthoracic vagotomy. In February, 1951, he had another hæmatemesis, and radiography revealed a large anastomotic ulcer. In May, 1951, he underwent subtotal gastrectomy, and anterior and posterior anastomotic ulcers were found at operation.

Case 3.—A man, aged 61, underwent gastro-enterostomy in 1939 for a duodenal ulcer which he had had for ten years. In 1941 his symptoms recurred, and radiography revealed an anastomotic ulcer. In 1943 the patient had a Polya-type gastrectomy, an anastomotic ulcer being found at operation. In October, 1949, he had a large perforated anastomotic ulcer. In November, 1949, he underwent transthoracic vagotomy. A postoperative insulin test-meal showed no hydrochloric acid. In December, 1952, symptoms developed of a gastrocolic fistula, which was confirmed radiographically and at operation a month later.

These 3 patients would seem to belong to a group of cases in which the ulcer tendency is so great that only a very radical subtotal gastrectomy might offer any hope of freedom from recurrence. The completeness of the vagotomy in these 3 cases might be doubted; but transthoracic vagotomy should give a much higher chance of complete vagal section, and in 2 cases the postoperative insulin test-meal, although unreliable when a gastro-jejunal anastomosis exists, does suggest a satisfactory vagal section. Furthermore, 3 of the 7 patients in group B had a similar history: 1 had had three "partial" gastrectomies for gastric ulcer and subsequent anastomotic ulcers, and 2 had had a gastro-enterostomy followed by two partial gastrectomies for duodenal ulcer and subsequent anastomotic ulcers. In contrast, only 2 of 15 patients in group A had had a gastro-enterostomy and later a partial gastrectomy for anastomotic ulceration.

AFTER GASTRO-ENTEROSTOMY

The results in 14 cases of anastomotic ulceration following gastro-enterostomy (group 2) are shown in table II. The small number is due to the fact that only cases in which vagotomy alone was done are included, cases in which other ancillary operations—e.g., excision of the ulcer, antrectomy, and re-forming the gastro-enterostomy—were done being excluded.

Conclusions

These results show that vagotomy is not a completely satisfactory method of treatment for anastomotic ulceration following partial gastrectomy, giving only two-thirds of the patients freedom from recurrence in a follow-up of about three years. Nevertheless vagotomy may be worthy of trial in such cases because, compared with the alternative of a more radical gastrectomy, it is safer.

When vagotomy is used in the treatment of anastomotic ulceration following gastro-enterostomy, the results are even more disappointing, 10 of 14 patients having definite or suspected recurrence. Therefore vagotomy alone has no place in the treatment of such cases.

Summary

39 cases of proved anastomotic ulceration treated by vagotomy have been followed up.

The results in anastomotic ulceration after partial gastrectomy were only partly satisfactory, and in anastomotic ulceration following gastro-enterostomy unsatisfactory.

I wish to thank the staffs of the hospitals visited, who are too numerous to mention individually, for their most helpful coöperation, without which this work could not have been done; Mr. Harold Burge, who instigated this investigation, for his advice and criticism; and Dr. Richard Doll for his helpful comments on the statistical analysis of the cases.

TRANSIENT SEXUAL PRECOCITY IN GIRLS

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THE term precocious puberty implies spermatogenesis or ovulation; when evidence of these processes is lacking, the condition is better described as sexual precocity. In girls this may be produced by lesions affecting the hypothalamus or by granulosa-cell tumours of the ovary, and very rarely by adrenal abnormality (Jolly 1951), but in the majority there is simply constitutional precocity. In such cases the physical changes persist, and eventually a normal state is reached when the girl's age makes the word precocious inapplicable. In the cases described here the signs of precocious sexual development disappeared completely.

Case 1.—The parents of this 4 3/4-year-old girl were Polish and Belgian. Both were healthy; the mother first menstruated when she was 11 years old. There was one other child, a boy of 3.

The girl had an uneventful early history and had never been ill. Three weeks before she was brought to hospital enlargement of the breasts was noticed. It was followed by growth of vulval hair, and three days before she attended the outpatient department she bled from the vagina.

The child was an attractive, intelligent brunette, and was large for her age. Some of her measurements are set out in the accompanying table, which shows that she was physically in advance of her age, except in head-circumference, which is often said to be a fairly true index of chronological age. Sexual precocity was shown in the breasts, which were

BODY MEASUREMENTS IN CASE 1

Measurement	Case 1	Average age (yr.) for figure in case 1
Weight	45³/₄ lb.	6½
Height (standing)	44½ in.	5¾
Height: Crown to pubis / Pubis to heel	1·02	10
Span / Height	1·01	9
Head circumference	19¹/₄ in.	4
Ossification	Advanced	6½
17-ketosteroids in 24 hr.	1·5 mg.	9

swollen to prepubertal proportions, with some enlargement of the nipples which were also pigmented. There was sparse dark hair over the pubic promontory, on the labia majora, and at the top of the adductor aspects of the thighs. She was admitted to hospital where examination of the urine and cerebrospinal fluid, red and white blood-cell counts, blood Wasserman test, and radiographs of skull and abdomen gave normal or negative results. The twenty-four-hour excretion of 17-ketosteroids was 1·5 mg., which is about four times as large as the limit found at this age by Talbot et al. (1943), but a single estimation shows only that there was not grossly excessive secretion.

Constitutional sexual precocity was diagnosed, and the child was not seen again for seven months, when she appeared perfectly normal except for her size and build and a trace of downy hair on the mons veneris and vulva. Her mother said that the signs of puberty had disappeared after a total period of six weeks, and there had been no further vaginal bleeding. This had surprised her at first, but she remembered that after leaving hospital the child had said that a woman living on an upper floor of the house where they lived used to invite her upstairs and give her sweets. This was without the mother's knowledge, for she had had " a bad quarrel " with the woman, who said she would get her own back and do it through the child. Recently the mother had discovered that the woman was being treated for a menopausal condition.

There the case rested; the child was well and the evidence was slight, so I thought it unwise to pursue matters to a possibly criminal conclusion. As a private thought, it was perhaps natural to wonder whether, in a girl whose physical growth suggested that there might be an over-active anterior pituitary gland, a few stilbœstrol " sweeties " might not have produced slight mammary enlargement, growth of sexual hair, and endometrial bleeding. For example, let us consider the following case:

This child was 8 years and 2 months old when she developed dysmenorrhœa and menstrual bleeding. One month previously the nipples and linea nigra had become darkly pigmented, and there was slight subareolar swelling. The bleeding occurred only once, and the pigmentation very slowly faded. Here the bone-age was not estimated and the ketosteroids were not measured, for it was known that in the course of treatment of vulvovaginitis she had been given 60 mg. of stilbœstrol in as many days, but that treatment had been stopped five days previously, the bleeding thus being an " œstrogen-withdrawal symptom."

The next case is not so easily explained.

Case 2.—This girl was the second child (the other being a boy) of healthy parents, and there was nothing unusual in her previous medical history. At 6³/₄ years she was brought to hospital with the story that she had been run-down and irritable for four months. After the first month, pigmentation of the areolæ was noticed; a week later there was enlargement of the nipples with a hard swelling under each areola, then enlargement of the left labium minor with pigmentation of the vulva and growth of pubic hair. Six weeks before she came to hospital there was bleeding from the vagina for five days, with slight dysmenorrhœa and the discharge of some clots. Then pigmentation and swelling of the breasts decreased, but pubic hair and the enlarged labium remained.

She was rather small for her age (weight 39½ lb.), a brunette with pigmented skin in the exposed areas, and also a linea nigra, and pigmented nipples and areolæ; in the latter there were tubercles, and under each areola there was a small swelling which was not tender. There was slight pubic and perineal hair, and the labia minora were enlarged, especially the left. There were no other physical abnormalities. The blood-pressure was 110/60 mm. Hg, and normal results were obtained in the following investigations: radiographs of skull, chest, abdomen and limbs; Mantoux test; examination of visual fields; plasma bicarbonate and chloride; serum-potassium; Kepler test for adrenal insufficiency; electrocardiogram; hæmatocrit. The twenty-four-hour excretion of 17-ketosteroids was 0·9 mg. on one occasion and 2·3 mg. on another. Estimations of urinary œstrogens (by Miss M. E. Wood), of pregnanediol (by Dr. W. H. H. Merivale), and of urinary gonadotropins (by Dr. G. I. M. Swyer) gave normal results.

Four months later the mammary regions were normal, and pigmentation and pubic hair less. Enlargement of the left labium persisted for a time, but after one and a half years she appeared a completely normal child.

These investigations were carried out in detail because Dr. Hugh Jolly was at that time studying sexual precocity (Jolly 1951); I did not see the child until more than two years had passed. She then seemed quite normal for her age, so I asked whether the girl could have got at any tablets or medicine before the unexpected development occurred. The mother at once denied this, and then said: " Now I come to think of it, at that age she might have taken anything she thought was sweets." " Was anybody at home being treated for anything then? " " Only myself, for obesity. I was having white tablets, I think they were 'Dexedrine,' and round, brown, shiny tablets that looked like chocolate."

I at once set about searching for a round chocolate-covered œstrogenic pill, but without success. Letters of inquiry were not answered by her doctor. All I discovered was that one well-known firm did put out a set of pills for obesity: one white, containing dexedrine, and one round, shiny, and chocolate coloured, which contained half a grain of thyroid. Interest evaporated, for so much thyroid is given to children for obesity that it seemed impossible that it could cause sexual precocity.

But is it impossible? We give children perhaps half a grain daily for obesity if we give it at all. A child encountering chocolate sweets, when sweets were rationed, would not take only one; and what do we know of the effect of single doses, taken on one or two occasions, of perhaps five or ten grains of thyroid?

" The administration of thyroid increases the gonadotropic potency of the hypophysis " (Smith 1942). In thyroidectomised adult monkeys (which have amenorrhœa) Engle (1944) showed that a single short course of thyroid treatment induced two or three relatively normal menstrual cycles. For long thyroid has been one of the standard resources of the gynæcologist called on to treat amenorrhœa, but I know of no record of its ability to produce uterine bleeding in children. Nevertheless in immature rats thyroxine administration causes graafian follicles and also corpora lutea to develop (Grumbrecht 1939), which must represent a true precocious puberty.

Let us suppose that in case 2 the girl took a large dose of thyroid and as a result developed, in addition to irritability, sensitivity to circulating gonadotropins (Grumbrecht 1939), with consequent uterine bleeding. Before she menstruated, the graafian follicles produced œstrogen and this caused skin pigmentation (as stilbœstrol does) and slight mammary development. Œstrogen would also make the pituitary produce adrenocorticotropic hormone which would stimulate the adrenals to produce androgen with resultant growth of sexual hair. (The more or less normal 17-ketosteroid excretion was estimated when the condition was already declining.) Such an explanation is merely speculative, but so would any other explanation be at this stage.

Nowadays there are many powerful endocrine preparations which can be taken by mouth, and their ingestion will have to be considered among the diagnostic possibilities in cases of sexual precocity. Since this account was originally written, Cook et al. (1953) have described

two similar cases, in one of which the child (a doctor's daughter) was known to have been given stilbœstrol in mistake for tablets of ascorbic acid. Cook refers also to the case of Prouty (1952) in which a boy of four showed mammary enlargement and pigmentation with growth of axillary and pubic hair. His mother was a stilbœstrol packer who sometimes worked at home, and the boy's 10-year-old sister developed pigmentation, mammary enlargement, and vaginal bleeding.

Summary

Two cases of female sexual precocity which later subsided are described. The possibility of the children having taken endocrine preparations such as stilbœstrol or even thyroid is considered.

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CLOSED RUPTURE OF THE TESTICLE

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IN closed rupture of the testicle the tunica albuginea ruptures with bleeding into the tunica vaginalis, but no laceration of the overlying scrotal skin. McCrea (1951) cited twelve reported cases and recorded one of his own. Dundon (1952) has reported a further case. The injury is therefore uncommon, owing, no doubt, to the extreme mobility of the testicle within the scrotal sac. This is in contrast to the more fixed maldescended testicle, which not uncommonly suffers trauma. There is little doubt, however, that more frequent operation in cases diagnosed as hæmatocele following trauma would sometimes disclose rupture of the testicle, as in the following case.

Case-report

A boy, aged 16, was seen in the casualty department late on a Tuesday evening. On the previous Sunday afternoon, while playing soccer, he had received the full impact of the ball, kicked by another player standing one foot away, on the right side of the scrotum. Local pain was not severe, and he had none of the symptoms usually associated with testicular injuries—namely nausea and vomiting with collapse. He left the field. On the Monday he went to work, but on the Tuesday pain in the testicle became severe and his father brought him to hospital. There was no hæmaturia.

The left testicle was normal. The right side of the scrotum was grossly œdematous, and there were ecchymoses at the base. The right testicle was enlarged to the size of a lemon; it was exquisitely tender, and this precluded any accurate examination. Hæmatocele, with possible rupture of the testicle, was diagnosed and exploration advised.

Operation.—An incision was made over the right testicle. The subcutaneous tissues of the scrotum were extremely œdematous. The tunica vaginalis was distended with blood-clot; and on opening it and evacuating the clot, a linear tear, $1^1/_2$ in. long, was disclosed on the anterior surface of the testicle, with devitalised testicular tissue extruding (see figure). A very conservative "débridement" of testicular tissue was performed, and after several clots had been extracted from the centre of the testicle the ruptured tunica albuginea was loosely approximated by three catgut mattress sutures. The tunica vaginalis was closed by two further catgut sutures, a small corrugated drain being introduced. The scrotal skin was closed with interrupted catgut sutures.

Progress.—The next day the relief of pain was dramatic. The drain was removed after forty-eight hours. The patient was finally discharged ten days after admission. His scrotal incision was well healed and local pain had disappeared, but the testicle was still slightly tender.

He was seen at the follow-up clinic six weeks after discharge from hospital. The right testicle was now of normal size and shape, and normal testicular sensation was present. There was no hydrocele, but a linear thickening could be felt on the anterior aspect of the testicle where the tunica albuginia had been sutured. The testicle gave the impression of being firmer on palpation than the contralateral normal organ, no doubt owing to the fibrosis of repair. The anatomical result was considered to be excellent; but of course the functional capacity cannot yet be assessed.

Discussion

Injury to the testicle usually occurs from kicks, blows, or falls astride, by which it is compressed against the thigh or pubic arch. It may also be severely injured in crushing injuries, such as road accidents, or by penetrating wounds. Injury during aspiration of a hydrocele is probably the commonest cause of trauma.

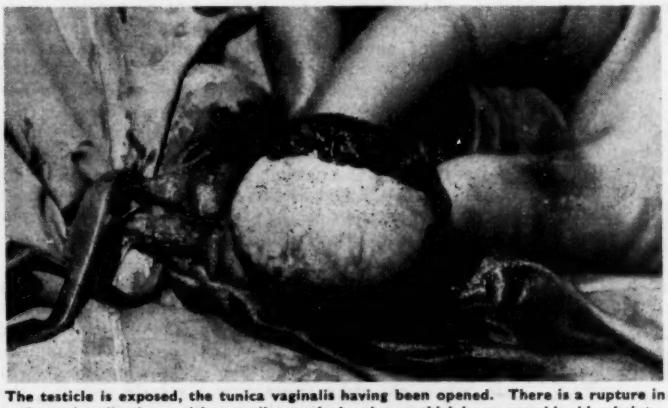
Campbell (1951) lists the following injuries: (1) contusion; (2) rupture of tunica albuginea; (3) penetrating wounds; (4) dislocation (simple or compound).

Penetrating injuries and dislocations of the testicle are obvious. An example of dislocation was recently seen in a boy, aged 17, under the care of Mr. Robert S. Garden, senior orthopædic surgeon.

He had been run over by a truck and had sustained fracture of the pelvis, dislocation of the right hip, compound fracture of the left tibia, and compound dislocation of the left testicle. The testicle, which was viable, was returned to the scrotum, and the laceration in the scrotal skin sutured with catgut. The wound healed by first intention; and when the patient was seen four months later at the follow-up clinic, the anatomical result was perfect.

Severe contusion and rupture are each associated with hæmatocele. In both, full examination is impossible because of local tenderness; and the two can be accurately differentiated only by exploration.

Testicular trauma is associated with pain of a peculiar sickening character, and shock and collapse are often out of all proportion to the local injury. In the present case there was no initial collapse, and the onset of severe pain was delayed for two days. Possibly the rupture in the tunica albuginea decompressed the testicle—the pain is, of course, due to tension caused by œdema and perhaps hæmorrhage within the rigid tunica.



The testicle is exposed, the tunica vaginalis having been opened. There is a rupture in the tunica albuginea, with extruding testicular tissue, which here resembles blood-clot.

Rupture does not necessarily cause more pain and swelling than does hæmatocele. It would therefore seem reasonable, as is our practice, to operate on all recent cases of testicular trauma associated with a hæmatocele and much pain and swelling, rather than to carry out the time-honoured treatment of aspirating the hæmatocele (evacuation of this is usually far from complete), applying local support, and administering sedatives. Even if only a hæmatocele is found, its evacuation is of considerable value. Otherwise the fibrosis subsequent on organisation of the blood-clot gradually compresses the testicle, leading to testicular atrophy; while the resulting "tumour" may later cause diagnostic difficulties, perhaps resulting in orchidectomy. If the testicle is found to be ruptured the tunica albuginea should be loosely sutured, and only the testicular tissue which extrudes between the sutures excised. The tunica vaginalis, but not the testicle, should be drained. Some workers (McCrea 1951) advocate resection of this tunica, as in the operation for hydrocele, no doubt to prevent hydrocele formation. Despite careful operation, some testicular atrophy is probably inevitable.

Summary

A case of closed rupture of the testicle is described.

A plea is made for exploration of recently traumatised testicles where there is much local pain and swelling. Probably many more cases of ruptured testicle would thereby be disclosed. Should only a hæmatocele be found, the evacuation of this is in itself valuable.

I wish to thank Mr. W. H. Graham for permission to publish this case, and also Mr. R. S. Garden for the details of his case.

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PREOPERATIVE ADMINISTRATION OF HELIUM IN RESPIRATORY OBSTRUCTION

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RESPIRATORY obstruction due to paralysis of the vocal cords is rare and may present many problems to the anæsthetist. In the following case tracheotomy was performed under general anæsthesia with the aid of a helium-oxygen mixture.

Case-report

A woman, aged 62, was admitted to hospital with a history of increasing dyspnœa at rest. Five years previously, thyroidectomy had been done elsewhere. Thereafter her voice had been husky and her breathing had become difficult on the slightest exertion. To quote her own words: "I could either walk or talk, but I couldn't do both together." Ten days before admission, following an upper respiratory infection, her dyspnœa had increased, and this had gradually become very severe.

The patient, who was obviously in considerable distress, was propped up in bed gasping for breath. She was cyanosed and unable to speak more than a few words at a time. There was gross inspiratory stridor, and the accessory muscles of respiration were in use. Her pulse was regular and of good volume at 120 per minute. No moist sounds could be heard over the lung-fields. The administration of oxygen did not noticeably improve her condition. An attempt was made to do an indirect laryngoscopy, but owing to her distress this had to be abandoned.

It seemed evident that the respiratory obstruction was due to abductor paralysis of the cords with superimposed œdema due to the respiratory infection. In view of the severity of the obstruction, it was decided to do a tracheotomy, and general anæsthesia was proposed.

Anæsthetic management.—The patient was given atropine gr. $^1/_{100}$ half an hour before operation. She was brought to the theatre in her bed. A mixture containing 21% oxygen and 79% helium was administered through a face-piece and reservoir bag. An improvement in the patient's condition was at once noticed; her breathing became easier and her colour improved, and the stridor assumed a higher pitch. After a few minutes she was able to lie down in bed without discomfort. The helium mixture was administered for a further five minutes, and then anæsthesia was induced with 0·2 g. of thiopentone followed by 50 mg. of suxamethonium chloride, intravenously. At the onset of muscle paralysis, the lungs were inflated with the oxygen-helium mixture, and a no. 6 cuffed endotracheal tube was inserted into the trachea under direct vision. Although the cords were adducted and slight œdema of the glottis was present, the bevel of the tube could easily be inserted into the small chink anterior to the posterior commissure and pushed into the trachea. The end of the tube was placed just above the carina and the cuff inflated. After intubation the patient remained apnœic for about ten minutes, despite the early return of muscle tone. The respirations had to be assisted manually and stimulated with carbon dioxide. Anæsthesia was maintained with oxygen, nitrous oxide, and minimal trichlorethylene.

A high tracheotomy was carried out, without hurry, well above the endotracheal cuff. On completion of the operation a suction catheter was passed through the tracheotomy stoma, in order to remove the blood which had collected above the cuff. The endotracheal tube was removed and the patient returned to the ward in good condition.

Discussion

Three procedures were considered in discussing the anæsthetic management of this case with the surgeon:

1. Carrying out the whole operation under local analgesia.
2. Intubation of the larynx under topical analgesia, followed by tracheotomy under general anæsthesia.
3. Carrying out the whole operation under general anæsthesia.

Local Analgesia

In the past this has been the method of necessity rather than choice. It is relatively safe, but the operating conditions that it provides leave a lot to be desired. The surgeon is operating on a distressed patient and has to contend with troublesome hæmorrhage produced by the raised venous pressure, the local effects of anoxia and raised carbon-dioxide blood-level.

The patient may die suddenly after the obstruction has been relieved. The cause of this was investigated by Negus (1938). He pointed out that in cases of chronic laryngeal obstruction, the carbon-dioxide content of the alveolar air may rise very considerably without any evidence of anoxæmia. The respiratory centre thus adjusts itself to a higher carbon-dioxide threshold. After the obstruction has been removed the alveolar carbon-dioxide level may fall to normal within a few breaths, but the threshold of the respiratory centre falls more slowly and so apnœa occurs from acapnia. This apnœa may persist and the patient die of anoxia before taking another breath. The administration of carbon dioxide and oxygen as soon as the tracheotomy has been done will help to prevent this catastrophe.

Topical Analgesia Followed by General Anæsthesia

For success in this manœuvre the coöperation of the patient is essential. The endotracheal tube may be passed blind through the nose, with very little local analgesia; or under direct vision through the mouth, which requires thorough topical analgesia. In the present case, where the rima glottidis was greatly reduced, the first method seemed hardly possible; and the second

likely to prove difficult since we had already failed to carry out an indirect laryngoscopy. Further, with either method trauma might increase any œdema of the larynx and so make a partial obstruction complete.

General Anæsthesia

The dangers of administering a general anæsthetic to a cyanotic patient with an obstructed airway are obvious. If much laryngeal œdema is present, even very brief anoxia may prove fatal by causing increased œdema. In the present case we believed that, provided full oxygenation could be obtained before induction of anæsthesia, and that rapid intubation could be assured, a general anæsthetic would be safe and desirable. The pre-anæsthetic oxygenation was achieved by means of the oxygen-helium mixture, and quick, non-traumatic intubation was made feasible by the use of suxamethonium chloride. The advantages of general anæsthesia are that the patient is asleep, the surgeon has good operating conditions and may take his time, and the anæsthetist has full control of the patient's airway.

The therapeutic use of helium-oxygen mixtures was first suggested by Barach (1934). He showed that in the tracheotomised dog with an obstructed airway, the substitution of helium for nitrogen in the inspired air considerably reduced the inspiratory effort of respiration. He suggested, therefore, that relief might be obtained in cases of asthma and other forms of respiratory obstruction. Doll (1946) in a carefully controlled series of six cases of status asthmaticus was unable to support Barach's suggestions. Eversole (1938) reported from the Lahey Clinic a large number of cases of respiratory obstruction which had been benefited by a helium-oxygen mixture. He emphasised, however, that the inhalation of this mixture was no substitute for a clear airway.

The flow of gases in the respiratory passages has been studied by Dean and Visscher (1941). They stated that when there is an upper respiratory obstruction the flow of gases changes from a laminar to a turbulent stream; and that under these conditions a helium-oxygen mixture, owing to its low density, has great advantages over either air or oxygen.

Finally, a word of warning must be given against the indiscriminate use of this method as the sole means of anæsthesia in this type of case or in allied conditions—such as Ludwig's angina and severe posterior pharyngeal abscesses. Each case must be assessed carefully. If, owing to œdema of the jaw-muscles, trismus is present, then no quantity of relaxant will enable the mouth to be opened and laryngoscopy to be done. Again, in cases of gross œdema of the floor of the mouth laryngoscopy will be difficult, if not impossible. Before deciding to use a general anæsthetic, the anæsthetist must satisfy himself that he can oxygenate the patient before the induction of anæsthesia, and that laryngoscopy and intubation can be carried out quickly and without trauma.

Summary

A case of severe laryngeal obstruction was treated by tracheotomy under general anæsthesia, preceded by administration of a helium-oxygen mixture.

We are grateful to Dr. George Edwards for his helpful criticism and advice, and to Mr. A. L. Pereira for permission to report this case.

Addendum

Since this article was completed a second patient with severe respiratory obstruction has been anæsthetised by this technique with satisfactory results.

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Medical Societies

ROYAL SOCIETY OF MEDICINE

Frontal Sinusitis

THE section of laryngology met on March 5, under the chairmanship of Mr. C. P. WILSON, its president, to discuss the Treatment of Frontal Sinusitis.

Mr. MAXWELL ELLIS said that acute and chronic infections of the frontal sinus were now less common and on the whole less serious than formerly. This was due partly to attenuation in virulence of the usual invading organisms and partly to modern chemotherapy. In sinusitis the outcome depended on the vascular connections, the vulnerability of the contiguous structures, and the efficiency of the drainage mechanism. In the case of the frontal sinus there were free vascular anastomoses with the diploic vessels, the orbit was in close proximity to the sinus, and the frontonasal duct was narrow and drainage therefore difficult. Acute frontal sinusitis must be clearly distinguished from chronic sinusitis. In acute cases treatment should be conservative, and resolution usually followed the correct use of sulphonamides and antibiotics. Hence treatment was aimed at a direct attack on the organisms, together with free drainage of the products of inflammation. If decongestants and simple lavage of the sinus were unsuccessful, a small opening was usually made through the floor of the sinus, without interfering with the frontonasal duct. Normal anatomy and physiology should be restored in the uncomplicated case. The result, however, was not always so happy. The infection might spread to bone, causing periostitis and osteomyelitis. Fortunately, with chemotherapy the acute spreading type of osteomyelitis was rare, but chemotherapy might lead to a less severe and more localised type of bony infection producing few, if any, symptoms for several weeks. Energetic treatment with antibiotics was almost invariably successful. In these cases the problem was to decide whether sequestration had occurred and whether drainage was efficient. It was essential to excise all dead tissue, after the spread of infection had been arrested, and to drain any loculi of infection. Infection could spread to the orbit directly through the bony floor of the sinus, but more commonly it spread through the venous connections. The orbital periosteum was very tough, and fulminating acute infections were now uncommon. The treatment should be conservative and, as in osteomyelitis, surgery was indicated only to provide drainage, remove dead tissue, and drain any abscess.

Chronic frontal sinusitis was the major problem today. Treatment of the chronic state must be radical. It was difficult to say which piece of mucosa was normal and which diseased, and it was therefore always safer to remove all the lining mucosa. The resultant scar tissue would then be healthy. It was also necessary to remove any subdividing bony septa, all the anterior ethmoidal cells, and any other ethmoidal cells that might be diseased. Chronic infection could supervene on polyposis, which made the membrane more vulnerable.

It was a common experience that the new opening made into the nose in drainage operations tended to stenose. Some surgeons thought that this would not happen if the frontonasal duct remained undisturbed, but Mr. Ellis disagreed with this view. He removed the whole floor of the sinus, all the anterior ethmoidal cells (since chronic disease in these cells was one reason for chronic disease in the sinus), and part of the pyriform aperture of the nose. In this way a short, straight, wide channel was formed. The soft tissues would be confined to their place by scarring if something were kept in long enough to produce this. A 'Portex' tube, as large as could be pulled up into the sinus through the nose, was effective; it retained its position solely by its tight fit.

Mr. Ellis had kept one tube in position for fourteen months with no adverse effects, and when removed it was clean and uncrusted. He had now observed one case for over two years, and, after a slight initial reduction in size, there had been no further tendency to contraction of the new opening. Mr. Ellis used the Howarth incision of access, extended at each end to permit greater excision of tissue.

Mr. H. D. FAIRMAN divided external operations on the frontal sinus into three main categories: (1) the simple drainage operation, which was often insufficient; (2) operations designed to enlarge the natural ostium, with preservation of all or most of the mucous membrane; and (3) operations designed to obliterate the frontal sinus, with removal of the mucosa. Most of the operations in this third group caused gross deformity, and sometimes recurrence ensued because some mucous membrane had not been removed. Nor were these operations free from the danger of causing osteomyelitis. All the same, an operation for removal of the diseased membrane together with obliteration of the sinus had always appealed to him as a rational procedure, and chemotherapy had removed almost all risk of spreading infection. Mr. R. R. Woods had introduced a great advance when he described an operation which would obliterate the sinus without causing deformity. Mr. Fairman had done this operation in 6 cases of chronic infection involving 8 frontal sinuses. There had been no relapses so far. The sinus was entered through its floor, which was removed completely. The mucous membrane was then dissected from the sinus with various blunt dissectors. A piece of gauze was then pulled through the infundibulum into the nose and the wound close-stitched in layers. A pressure-bandage was applied and the patient instructed to refrain from nose-blowing. Antibiotics were given for at least three weeks after the operation. All patients had experienced diplopia; this was always slight and was usually transient, but it had persisted in 1.

Mr. RONALD MACBETH confined his remarks to the surgical treatment of chronic frontal sinusitis, which, he said, was one of the most difficult items of rhinology. Operations fell into two main groups: (1) those designed to enhance drainage; and (2) those designed to eradicate irreversibly diseased mucous membrane, disregarding any resulting disfigurement. It was, in his opinion, wrong to insert tubes of plastic or squamous epithelium and leave them in the nose, since this was contrary to the physiological principles of ciliated membranes. What was needed was something analogous to the Caldwell-Luc operation for chronic maxillary sinusitis. Woods's operation came near to this. The frontonasal duct stenosed completely after Woods's operation; and Hilding had shown that in dogs bone or fibrous tissue obliterated the cavity of the sinus after the mucous membrane had been stripped. Unfortunately Woods's operation was difficult; and, when radical treatment was necessary, Mr. Macbeth favoured an osteoplastic operation as described by Gibson and Walker.

The scalp was incised by a hair-line incision, and the anterior wall of the sinus was cut with dental burrs and lifted forwards with the skin. The blood-supply to the bone was thus preserved and an excellent exposure obtained. The outline of the sinuses could be mapped out by a radiographic technique described by Dr. P. W. E. Sheldon. A series of burr-holes was made along the limits of the sinus and joined by a cutting burr. The "lid" so formed was then prised forwards and upwards with a broad osteotome. The mucosa could be stripped to the orifice of the frontonasal duct, and infected ethmoid cells were also exenterated easily. The scalp was sutured in two layers. Each of 16 patients whom Mr. Macbeth had treated in this way had either ceased to have headache or continued to have only an occasional slight niggle. The advantages of the osteoplastic operation were that both frontal sinuses could be inspected together and any diseased tissue removed, together with the fronto-ethmoid cells. Its disadvantages were the long incision and the possibility of considerable blood-loss.

Mr. C. GILL-CAREY commented on a total of 408 cases operated on by the external route—276 at the Massachusetts Eye and Ear Infirmary in a fifteen-year period up to 1946, and 132 at the Royal National Throat Hospital in a sixteen-year period up to January, 1954. Chemotherapy had almost completely removed the risk of death, but no such dramatic improvement could be seen in the results of surgical treatment. About half the American cases were treated without the aid of chemotherapy; in the whole series the mortality was 15%, but there had been only 1 death in the latter part of the series when chemotherapy was used. In the 132 cases from the Royal National Throat Hospital there was 1 death. Counting the need for a second operation by the external route as a failure, the proportions of failures were: Massachusetts Eye and Ear Infirmary 34%, and the Royal National Throat Hospital 29%. Analysis of the causes of failure showed close correspondence with Weille's [1] conclusions. Neither operations designed to improve drainage nor obliterating operations were free from a considerable failure-rate. In the first type of operation most failures were due to stenosis of the nasal opening, and in the second to incomplete removal of mucosa.

In Mr. Gill-Carey's view, none of the operative techniques described at the meeting differed materially from those used in the past. He suggested that the prognosis was influenced by the type of sinusitis. Pure infective sinusitis usually presented no difficulties; but in hyperplastic, polypoid disease, which was a local manifestation of a general disease, the prognosis was uncertain.

Mr. WOODS favoured obliteration of the frontal sinus in chronic infections, but he did not think that it mattered how the sinus was exposed. The orbital approach was a lesser operation; it was also safer because one did not expose wide areas of bone. Furthermore, one sinus only might be opened instead of both, and there would always be an area permanently uncovered with bone. The osteoplastic approach gave a wider exposure and might therefore be better with large sinuses. Both sides could be dealt with together much more easily. These operations depended essentially on obliteration of the frontonasal duct; the membrane was then removed and the clot organised subsequently into fibrous tissue or bone. With the duct closed and the sinus obliterated reinfection could not take place. Originally Mr. Woods did not open the ethmoids, since he felt that this would render complete obliteration of the frontonasal duct less certain. But he had recently seen Mr. Macbeth do an osteoplastic type of operation with removal of the ethmoids and was now inclined to think that the frontonasal duct would close even after a relatively large opening had been made into the nose by removal of ethmoids. He did not agree with the old maxim that the ethmoid cells were the key to the frontal sinuses. This was merely an excuse for failure due to an inadequate operation.

Mr. V. E. NEGUS had found the Howarth-type operation very satisfactory. He put in a portex tube and covered it with a Thiersch graft. It was, he agreed, unphysiological to leave a tube in for, say, three months; but it was not unphysiological to leave one in for ten days, as he did. The posterior wall of the opening was not covered with the graft, and ciliated epithelium persisted here and on the septum, and on the septum between the frontal sinuses of the two sides. In only 3 cases of one series of 100 had the new opening become tight.

Prof. G. DOHLMAN doubted whether really big operations were often necessary in chronic cases. He had seen

1. Weille, F. L. *Ann. Otol., &c., St. Louis*, 1946, **55**, 372.

relatively few cases with good results. He could see no objection to leaving an opening with drainage, washing out the sinus daily, even for months, and then deciding whether the frontonasal duct would recover. If it had opened, the drain could be removed and the incision closed. If it had remained closed and bony infection were present, better drainage through the nose could be effected by an external operation.

New Inventions

A HIP-ARTHROPLASTY EXERCISER

A DEVICE for mobilising the hip-joint after arthroplasty has been described by Charnley and Wright [1] which uses a spring-loaded overhead beam from which the limb is suspended. The apparatus described here achieves the same result but has the great advantage that it can be assembled in a few minutes from components to be found in any hospital. It is impossible to provide any form of traction with this appliance; it has been used exclusively for Judet-type arthroplasties, and in most of these traction has proved unnecessary.

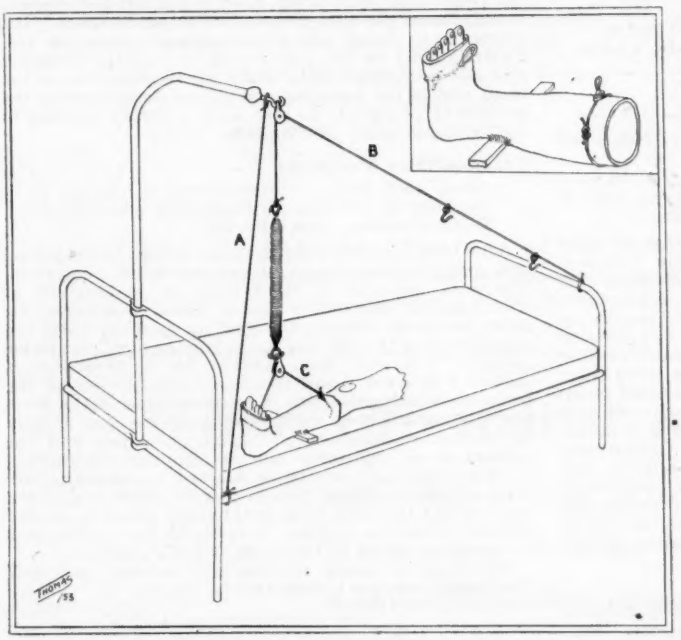

Fig. 1.

Before the patient leaves the theatre after operation, a below-knee padded plaster cast is applied, to which is attached with a plaster bandage a 12-in. length of wood to maintain the limb in neutral rotation. When the plaster is completed, two loops of blind-cord are attached (fig. 1, inset) which encircle the cast and are buried beneath a couple of turns of plaster bandage, leaving the two small loops projecting from the front of the cast in the midline of the limb. The plaster must extend well up over the head of the fibula. A short cast is liable to produce foot-drop by pressure on the external popliteal nerve as it winds round the neck of the fibula. At the same time the plaster should permit at least 90° knee flexion.

The patient's bed is turned round so that the head of the bed lies at the patient's feet. Above the feet the ordinary bed crane is fitted, and string A is attached to give an abduction bias to the crane, the hook at the top of which should lie vertically over a point about 12 in. from the edge of the mattress. The rest of the rigging is arranged as shown in fig. 1. The 50-lb. spring is from the Guthrie-Smith suspension apparatus found in most physiotherapy departments. If such a spring is not available, a few loops of strong catapult elastic should provide an adequate substitute. The two S hooks can be bent from $^1/_8$-in. silver steel wire or from heavy-gauge galvanised-iron fencing wire. Two small pulley blocks are also required. Blind-cord is used for strings B and C (fig. 1).

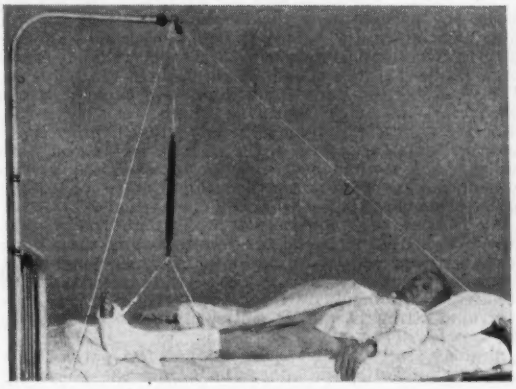

Fig. 2.

The resting position (fig. 2) is maintained for three postoperative weeks. The spring is not in tension, and the limb lies on the bed with a very small pillow behind the knee to prevent hyperextension of this joint. In addition a heavy sandbag is placed against the medial side of the plaster to prevent adduction of the limb, which might dislocate the hip. Regular quadriceps contractions and toe movements are practised in these first three postoperative weeks. When the patient is using a bedpan or having his bed made, the apparatus is "cocked" (fig. 3) so that the limb is raised from the mattress.

At the end of three weeks the sandbag is removed and the patient starts exercising the limb for ten minutes in each hour during the day. This routine is continued for a further three weeks, at the end of which the apparatus is dismantled, the plaster cast removed, and re-education in walking started.

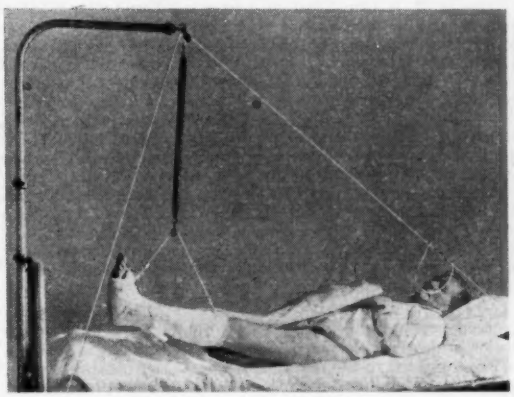

Fig. 3.

1. Charnley, J., Wright, J. K. *J. Bone Jt Surg.* 1951, **33B**, 634.

To "cock" the apparatus for exercising the hip and knee, the patient pulls the overhead string B towards him and engages the two S hooks with one another (fig. 3), thus putting the spring into tension. This should raise the heel of the plaster 12 in. clear of the mattress. The weight of the limb is now supported entirely by the plaster. When suspended, the limb can be swung effortlessly into abduction and adduction. When knee and hip flexion is practised, the string C runs through its pulley. The hip-extensor muscles are exercised by the patient forcing the limb, with straight knee, on to the mattress against the resistance of the spring.

At the end of each period of exercise the patient uncouples the S hooks, and the limb returns to the resting position. The limb must never remain suspended when it is not being exercised; otherwise the plaster tends to become uncomfortable. Blind-cord stretches considerably, and strings A and B will require shortening after the first few days.

A great asset of this set-up is that the patient has complete control of the apparatus. Once the exercising routine has been established under the control of a physiotherapist, the patient can carry on single-handed throughout the day.

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Reviews of Books

Modern Trends in Diseases of the Ear, Nose and Throat

Editor: MAXWELL ELLIS, M.D., M.S., F.R.C.S., surgeon, Roy. l Nation l Throat, Nose and Ear Hospital, London. London: Butterworth. 1954. Pp. 471. 65*s*.

THE editor has enlisted the help of more than 20 other specialists in writing this new addition to the "Modern Trends" series. The result is wholly refreshing and stimulating. The writing may be said to fall roughly into two main groups, about equally divided. One group covers familiar work on familiar subjects and contains little or nothing that is very new; but each chapter derives its value and the pleasure it gives from being contributed by an acknowledged expert. The other group is particularly welcome at a time when far too much new (and old) work is accepted without question, recorded, and finally passed from book to book. Outstanding among these thoughtful chapters is the editor's own convincing challenge to Semon's "law." These more controversial authors are not themselves necessarily right because they are controversial; but by ploughing up territory which has been allowed to lie fallow far too long, they make way for a new harvest.

Appraising Personality

The Use of Psychological Tests in the Practice of Medicine. MOLLY HARROWER, PH.D., research director, Court Intake Project, New York City Court of Domestic Relations. London: Routledge & Kegan Paul. 1953. Pp. 197. 18*s*.

THIS book is described as being written primarily for doctors and psychologists but also for social workers, clergymen, lawyers, teachers, counsellors, nurses—and in fact any interested layman. It is cast in the rather trying form of a series of dialogues by a clinical psychologist and a general-practitioner doctor, and is concerned with the work of the former. This is rather a drawback for the British reader, for the profession of clinical psychologist is not so widely recognised here as in the United States. Opinions on the relative merits of the practice in the two countries vary considerably among psychologists and psychiatrists in this country; but the professional ethics of the clinical psychologist in the book leave nothing to be desired, for he seldom sees patients unless referred by a medical colleague, nor does he embark on their treatment.

The book is well written. A good idea of the work of the psychologist, and the methods he employs, especially in the field of projective tests such as the Rorschach and the Szondi test, is presented to the reader in accurate but palatable form, and there are good illustrations and figures. It all ends happily with the case-histories and psychological profiles of the various cases which the general practitioner—now converted to quite an enthusiasm for clinical psychology—refers to his friend and mentor for the appraisal of their personalities.

The Deaf and Their Problems

KENNETH W. HODGSON, M.A. Camb. London: Watts. 1953. Pp. 356. 21*s*.

THIS book falls into three parts: (1) a preliminary account of the ear and hearing; (2) a historical account of the education of the deaf; and (3) a discussion of the problems of deafness, especially in children in the 20th century. The first part unfortunately contains some incorrect statements, such as that the presence of the chorda tympani in the ear-drum "causes the risk of facial paralysis resulting from tympanic infection or from operations upon the tympanum." In the second, and largest, part Mr. Hodgson presents an immense amount of useful information about the various attempts at education of the deaf; but he does not do justice to medical contributions—for instance, he does not mention the work of Dr. Max Goldstein and the Central Institute of the Deaf—and some of the most important non-medical contributions are also disposed of in small space. His reference to Itard and Urbantschitsch shows no real understanding of the possibilities of auditory training, and the residential units which he recommends in the third part of the book seem to us less desirable than the enlistment of parents to give early auditory training to deaf children using hearing-aids.

Traumatismos Medulares

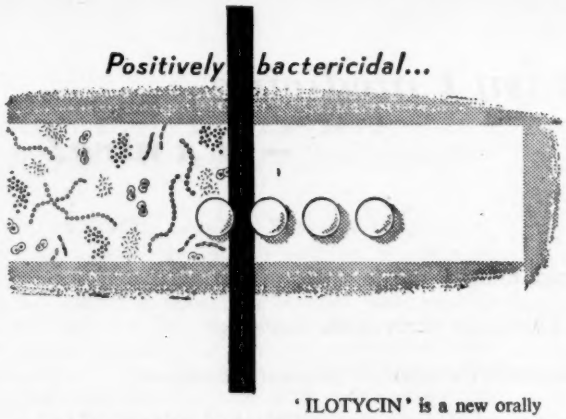
Spinal Cord Lesions. VICTOR SORIANO, profesor de la Facultad de Medicina de Montevideo. Buenos Aires: Editorial Labor. 1953. Pp. 366.

THIS book is mainly a contribution to the understanding and general management of posttraumatic paraplegia. The work was done in Montevideo at the Institute of Traumatology directed by José L. Bado. It is a laudable effort to spread through the Spanish-speaking world the experiences of the late war in the treatment of paraplegic patients. Having been written by a physician, it describes in great detail the neurological aspect of the problems which arise, but it includes some of the more outstanding advances made during the war, particularly as to the management of bladder paralysis and the prevention of bed-sores and of crippling deformities. A somewhat short section is devoted to rehabilitation. It is a little surprising that in a work which includes a copious and thorough bibliography and refers to several British works, no mention is made of the outstanding contribution of Dr. L. Guttman on rehabilitation.

The book is clearly written, well printed, and well illustrated, and will benefit all who read it.

Deutsch-Englisches, Englisch-Deutsches Wörterbuch für Ärzte (Stuttgart: Thieme. Vol. II. 1953. Pp. 1737. DH. 58.50.).—The German-English volume of this dictionary, which was issued in 1951, occupied 1349 pages; but since the pages were of fine paper measuring only 6 in. by $3^1/_2$ in. the book fitted comfortably into a pocket. The English-German volume, for which Prof. Fritz Lejeune has enlisted the help of Mr. Werner Bunjes, would require a poacher's pocket. Its greater length is no doubt partly due to the German economy in words and the prevalence of synonyms in English. Though this work is designed primarily for those speaking German (pronunciations are given only for English words), its clarity, compactness, and comprehensiveness should appeal to English-speakers. Its final words—*In einem Wörterbuch kann nicht alles stehen*—though defensive in intent, may seem ironical to less successful compilers.

Modern Treatment Yearbook 1954 (London: Baillière, Tindall. & Cox (for the *Medical Press*). 1954. Pp. 351. 21*s*.).—The new edition of this popular yearbook, which, as Sir Cecil Wakeley, the editor, remarks in his preface, has almost reached its majority, maintains the standard set by its predecessors. Thirty-six articles on subjects likely to be of interest to the general practitioner are contributed by experts in various fields. There are 24 photogravure plates and 55 figures, and an index.



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THE LANCET

LONDON: SATURDAY, MARCH 20, 1954

Hospital, Doctor, and Patient

IN the case of the plaster cast at Nottingham assizes (summarised on p. 619) it was established that a child of 6 went into hospital with healthy legs and came out a cripple, with the left leg withered. Mr. Justice STABLE held that the matron and the management committee of the hospital had been guilty of a high degree of negligence over a protracted period and he awarded £5000 damages against them. Throughout the hearing the learned judge laid emphasis on the change of situation created by the advent of a National Health Service:

> "When we had assisted voluntary hospitals, if I was brought in from the streets a dying pauper, any treatment I received (and no doubt the best that science could provide) was an act of charity. Now we have gone over to the State system, and it is a matter of right for which every citizen has paid. The hospital authorities are just as much his paid servants as anybody else; if anybody has got a different idea, they had better think again."

Incidentally in the case at Nottingham there had been a lamentable delay in telling the parents the unhappy news that their child would be a cripple for life. "I would like to know," said the judge, "if this is the system under our State medical service." The answer, we believe, is that the people who work in the N.H.S. are no more addicted to a perverse secrecy than are the people who supply medical care privately. It should hardly be necessary to emphasise that the Act of 1946 did not invent institutional treatment and its problems; and long before Parliament enacted it the courts were examining claims for damages based on allegations of negligence on the part of hospitals. On the other hand, the Act of 1946 has certainly made men and women more health-conscious, and the citizen's right to medical treatment may have inspired the belief that the State guarantees him either a cure or handsome compensation. He believes this perhaps the more readily because he has been told so much about the miracles of modern science. If his health is not restored and his disabilities are not made good, it must be somebody's fault. Free legal aid, if he needs it, will give him the means of enforcing whatever rights he claims to enjoy.

At Nottingham the doctor in charge of the patient was not joined as a defendant, but allegations of negligence on his part were allowed for the purpose of establishing the case against the management committee. Whatever the effect of any appeal from the decision, we face once more the problem of legal liability in the triangle of hospital, doctor, and patient. Clearly we shall soon have to make up our minds on what is a far more important issue even than the encouragement of litigation—harmful though this can be. This larger issue is that of professional responsibility; and it has lately been raised again by a series of articles in the *Scotsman* discussing the odd difference between the English and Scottish law of the relative liability of hospitals and their medical staff.[1] In Scotland, it will be remembered, the responsibility of hospital managements is to provide an efficient hospital, to keep it warm, clean, and wholesome, to furnish it for the adequate reception of patients, to supply it with the necessary food and medicine, and to employ a competent staff. If the patient suffers through the negligence of the medical staff, the hospital is not liable. In England, at first, the courts took a like view. In 1909 the familiar case of Hillyer *v.* St. Bartholomew's Hospital established that the governors of a hospital had no more responsibility in this respect than to use care and skill in selecting their physicians and surgeons. But twelve years ago the English courts changed their opinion. Thenceforth they applied to hospitals and hospital doctors the law of master and servant. Although the hospital managers could not direct their physicians what to diagnose or prescribe, or tell their surgeons whether and how to operate, the principle of vicarious liability was extended to them. This change of view, be it noted afresh, occurred before the National Health Service Act was introduced; it had nothing to do with the advent of "nationalised medicine," though it becomes the more significant now because the patient no longer regards as, in Mr. Justice STABLE's phrase, "an act of charity" the treatment which he receives in a public hospital.

If hospitals can be sued for damages on the ground of the negligence of the doctors they employ, special forensic conditions arise. The hospital may want to throw the blame on the doctor, or vice versa: juries, too, may be the more generous if they reflect that the supposedly bottomless purse of the State may be available to pay the damages awarded against the hospital. But what chiefly matters is to decide which legal principle is preferable for the ultimate good of the medical profession and of the practice of medicine—the English or the Scottish. To relieve the very real anxieties of casualty officers and others, the English principle might be extended until the Ministry accepted full responsibility for all the actions of its "employees"; but if the doctor's liability to answer for negligence were removed in this way he would gain security at the cost of his professional freedom. It would be evident that his primary responsibility was not to the patient but to a lay committee and, through this committee, to a Minister who undertook to treat patients and to answer for everything done to them. How can the medical practitioner tolerate the view that he is the employee or the servant of anybody but his patient?

Coma

WHATEVER may be thought of the relation of mind to brain, the preservation of consciousness undoubtedly depends on the metabolic activities of cerebral cells. Reduction of the metabolism of these cells results in impaired cerebration and possibly coma. Thus cooling of the brain leads to somnolence merging into unconsciousness; slowly developing anoxia causes a similar sequence (as was inadvertently

1. *Scotsman*, Dec. 28 and 29, 1953; March 8, 1954.

demonstrated by some of the early balloonists); while the rapid induction of severe anoxæmia, as by the inhalation of pure nitrogen, causes very sudden loss of consciousness. Deprivation of glucose—the normal source of almost all the energy released in cerebral neurones—produces an identical end-result, although the prodromal manifestations may be somewhat different. Indeed any serious interference with the complex series of chemical processes by which glucose and oxygen react to liberate energy in the cerebral cortex will lead to unconsciousness.

FAZEKAS and BESSMAN [1] have reviewed the pathogenesis of coma on the basis of the factors which prevent efficient oxidative metabolism in the cerebrum. They classify these factors under three main headings, which may conveniently be condensed to two. First, there is "substrate insufficiency," which may be a primary result of actual shortage of either glucose or oxygen in the arterial blood or may be secondary to circulatory failure with consequent breakdown in the transport of these substances to the brain-cells. Secondly, they recognise a group of disturbances in intermediary metabolism, exemplified by the encephalopathy of aneurine deficiency (which PETERS [2] linked with in-vitro impairment of glucose-oxidation at the 3-carbon level) and by the cerebral symptoms attending deficiency of other vitamins. The effects of certain anæsthetics, such as the barbiturates, can also be included under the same heading, on direct evidence derived from work on isolated tissues.[3]

Now that cerebral blood-flow is measurable by the Fick principle,[4] the "cerebral metabolic rate" (C.M.R.) can be estimated from the oxygen uptake in the cephalic circulation. From their own studies and those of other workers, FAZEKAS and BESSMAN cite evidence indicating that the C.M.R. is depressed in many forms of coma; and in cases due to hypoglycæmia or aneurine deficiency specific treatment usually restores the C.M.R. towards normal. In each of four patients, however, who suffered irreversible brain damage during episodes of hypoglycæmia or anoxæmia, the C.M.R. remained depressed even after glucose and oxygen had been supplied in abundance; and similar continued depression was found in a case of persistent coma after head injury. It is notable that the C.M.R.s were lowest in cases where the brain damage proved irreversible. In the hypoglycæmic and traumatic cases anoxia was possibly the immediate cause of this damage, for respiratory obstruction is a constant hazard of the comatose state. The only type of coma normally experienced—namely, sleep—is not listed in HIMWICH'S [5] exhaustive survey of data on the C.M.R. Clearly the manipulations needed to measure the C.M.R. during natural sleep would not be easy; but, possibly with the aid of a hypnotist, they should not be impossible. HIMWICH suggests that the stupor after a convulsive seizure may be due to relative anoxia of the neurones following the heightened metabolic demands in the period of explosive discharge.

1. Fazekas, J. F., Bessman, A. N. *Amer. J. Med.* 1953, **15**, 806.
2. Peters, R. A. *Lancet*, 1936, i, 1161.
3. Quastel, J. H., Wheatley, A. H. M. *Biochem. J.* 1934, **28**, 1521.
4. Kety, S. S., Schmidt, C. F. *J. clin. Invest.* 1948, **27**, 476.
5. Himwich, H. E. Brain Metabolism and Cerebral Disorder. Baltimore, 1951.

Under the heading of disturbance of intermediary metabolism might be included the coma of heat exhaustion,[6] although in this a circulatory element clearly operates. The narcotic effects of the steroid hormones could also be placed under this heading, and so possibly could the depressant action of carbon dioxide in excess. This action has recently been observed after oxygen therapy in severe pulmonary insufficiency [7]; in such cases the provision of extra oxygen removes the stimulant effect of anoxæmia on the flagging respiratory rhythm, and so produces further retention of carbon dioxide with resultant cerebral depression. Dr. WALSHE'S observation of increased glutamine in the cerebrospinal fluid in hepatic coma,[8] and of a favourable response to administration of glutamate,[9] which is known to bind ammonium ions, led to the suggestion that an increased concentration of ammonium in the cerebral tissues may play a part in producing this type of coma. Ammonium has been shown to upset the metabolism of carbohydrates by enzyme systems from brain [10]; so by this token hepatic coma might be included in the group ascribed to blockages of intermediary metabolism (although the evidence here is not clear-cut). MCDERMOTT and ADAMS [11] have described stuporose attacks in a patient with a portacaval fistula which were associated with a demonstrable rise in the blood-ammonia. These workers hesitate to suggest a direct causal relationship between the stupor and the raised blood-ammonia; and certainly such an association would be difficult to reconcile with the pharmacological action of ammonia on the central nervous system, which is excitatory rather than depressant.[12]

FAZEKAS and BESSMAN admit that the classification of some of the common comatose states seen in neurological practice is not always easy, and that localised lesions in certain regions of the brain may result in loss of consciousness without necessarily affecting the metabolism of the whole brain. Thus the coma of intracranial hæmorrhage and space-occupying lesions can be attributed to a combination of "substrate lack," secondary to circulatory insufficiency, along with local disorganisation of specific areas, such as the neighbourhood of the third ventricle. Rather despairingly, FAZEKAS and BESSMAN classify these cases under "coma of multiple etiologies."

From the work of HODGKIN [13] and his colleagues in the past few years has emerged a quantitative relation between the action-potentials of nerves and the movement of ions across their surface-membranes; while KREBS and his group [14] in Sheffield have demonstrated the dependence of ionic movement in isolated brain-slices on the oxidation of a substrate. While the intimate mechanism underlying this dependence is not yet clear, it does seem that we are approaching the partial fulfilment of Sir WILLIAM GOWERS'S prophesy nearly fifty years ago. That great

6. Cohen, S. *Amer. J. Med.* 1953, **15**, 813.
7. Lovejoy, F. W. jun., Yu, P. N. G., Nye, R. E. jun., Joos, H. A., Simpson, J. H. *Ibid.* 1954, **16**, 4.
8. Walshe, J. M. *Quart. J. Med.* 1951, **20**, 421.
9. Walshe, J. M. *Lancet*, 1953, i, 1075.
10. Weil-Malherbe, H. *Biochem. J.* 1938, **32**, 2257.
11. McDermott, W. V., Adams, R. D. *J. clin. Invest.* 1954, **33**, 1.
12. Ajmone-Marsan, C., Fuortes, M. G. F., Marossero, F. *Electroenceph. clin. Neurophysiol.* 1949, **1**, 291.
13. Hodgkin, A. L. *Biol. Rev.* 1951, **26**, 339.
14. Torner, C., Eggleston, L. V., Krebs, H. A. *Biochem. J.* 1950, **47**, 138.

neurologist wrote [15] of "the prospect that all material elements will be discerned to be forms of electrical energy," and predicted that "organic chemistry must share the altered thought, and the mysterious electrical changes that attend nerve action may thus become intelligible."

Growth of Premature Children

Now that an increasing proportion of premature infants are reared, it is important to know how far they are likely to overcome their initial handicap. In the past thirty years many attempts have in fact been made to compare the development of premature and "mature" or full-term children [16]; but the results can seldom be accepted at their face value. The two main reasons for their unreliability have been that a large proportion of surviving premature infants have not been traced, and that no suitable control group of mature infants has been presented.

What promises to be the first reliable follow-up study of prematurity was begun in 1946 under the direction of a joint committee of the Institute of Child Health of the University of London, the Society of Medical Officers of Health, and the Population Investigation Committee. Premature children from all parts of the country and from all social classes are being watched and compared with a group of mature children, and it is intended that this surveillance shall continue throughout childhood and adolescence. The joint committee enrolled all legitimate premature singletons ($5^1/_2$ lb. or less) born in England, Wales, and Scotland during the first week of March, 1946, and each of these was paired with another child selected from the mature legitimate singletons born during that week who was of the same sex and place in the family, who lived in the same locality, and whose mother was of the same age and came from a family in the same social group. The success of the follow-up is a great tribute to the efficiency of the survey: although 204 of the original 676 were lost by death or emigration, only 8 of the remaining 472 were untraceable or refused to coöperate. The number of pairs excluded at any particular interviewing age was, however, considerable, since both children of a pair were necessarily excluded if information about one of them was not to be had. The survey children were weighed at birth and were weighed and measured at 2 years and $4^1/_4$ years. The results of the first four years of the survey are being published in three reports. The first by DOUGLAS and MOGFORD,[17] to which we referred a few weeks ago,[16] described the health of the children; the second, recently published by the same authors,[18] records their growth; while the third will deal with their development and behaviour.

At both 2 and 4 years the premature children were, on the average, lighter and shorter than the controls; they were about 2 lb. lighter at 2 years, $2^1/_2$ lb. lighter at 4 years, and 1 inch shorter at both ages. By the age of 2, 31% of the premature group had caught up with or surpassed the controls in weight and 44% had caught up with or surpassed the controls in height, and at 4 years the comparable figures were 36% and 44%. It is of special interest that at 2 years the premature children with birth weights of 4 lb. or less had not been so successful as the heavier prematures in eliminating their initial handicap, but at 4 years they had been more successful. There was no statistical evidence that either the length of gestation or the medical history of the pregnancy was related to the physical handicap of prematures at the age of 4 years. Rather surprisingly it was found that the smallest premature children, weighing $3^1/_2$ lb. or less at birth, were no more stunted or underweight than the heavier ones; but there were only 13 children in this group: 3 were underweight and 1 both underweight and underheight—the same proportion as in the heavier groups of premature children. It would be unwise to assume from such a limited experience that very premature infants, with a birth weight of 2–3 lb., do not show any greater handicap at the age of 4 years than less premature infants; for this does not accord with general experience. Realising this, the investigators have not drawn any definite conclusions about the prognosis of very premature infants as regards growth.

The mothers of the premature children who caught up with their controls in either weight or height were drawn from the same weight or height population as the mothers of the control children: the mothers of the premature children who did not catch up were drawn from a significantly lighter or shorter population. This amplifies the observation of BAIRD [19] and THOMSON [20] that the mothers of children who weigh $5^1/_2$ lb. or less at birth, and are therefore by definition premature, are on the average smaller than the mothers of those who weigh more than $5^1/_2$ lb. at birth. Unfortunately it was not possible to measure the fathers, but the same principle probably applies to them. As everyone knows, the stature of children depends largely on the stature of their antecedents—assuming that nutrition is satisfactory. We should not forget that the genetic factor applies to children of low birth weights as well as to those with high ones; and so, of course, do nutritional factors. DOUGLAS and MOGFORD find that, in predicting the subsequent growth pattern of premature children, the height of the mother is of greater value than the birth weight, the length of gestation, or the medical history of the pregnancy, and that the shorter stature of the mothers of premature children is probably genetic rather than the result of poor nutrition in early life. Clearly, assessments of the physical handicaps of children who are small at birth must be related to the size of their parents. "Premature" is in fact an unsatisfactory term for infants weighing at birth less than the arbitrary $5^1/_2$ lb.; some of these infants are fully mature, and a few may have their "proper" birth weight.

It is encouraging to have this convincing proof that the deficiency of growth shown by a majority of premature children, at any rate in the first four years, is only slight and of no clinical importance. The analysis of development and behaviour to be published in DOUGLAS and MOGFORD's concluding paper will be awaited with keen interest.

15. Gowers, W. R. The Border-Land of Epilepsy. London, 1907.
16. See *Lancet*, Jan. 2, 1954, p. 29.
17. Douglas, J. W. B., Mogford, C. *Brit. med. J.* 1953, i, 748.
18. Douglas, J. W. B., Mogford, C. *Arch. Dis. Childh.* 1953, **28**, 436.
19. Baird, D. *J. Obstet. Gynæc., Brit. Emp.* 1945, **52**, 339; *Lancet*, 1949, i, 1079.
20. Thomson, A. M. *Brit. J. Nutr.* 1951 **5** 158

Annotations

BEDSORES

BEDSORES are found at sites where the skin and deeper tissues are subjected to long-continued pressure, usually between bed and bony prominences. The traditional view which associated them with bad nursing presumed that the initial lesion was in the skin, and their frequency in flaccid paralysis and peripheral nerve injury was accordingly linked with trophic change in the skin. The work of Groth [1] and others, however, has shown that skin and subcutaneous fat are less susceptible to pressure effects than the underlying muscle, and pressure on muscle near bony prominences may cause an initial deep lesion which by extension develops into a typical bedsore.

The effect of pressure in inducing damage to the skin and underlying tissues has been further investigated by Husain [2]; and his results, which support this view of the origin of bedsores, are confirmed histologically in man. Husain finds that a plethysmograph applied to a rat's tail at a pressure as great as 800 mm. Hg for six hours induces no permanent change in the skin. A pressure-cuff applied to a rat's leg, however, causes acute necrosis of the underlying muscle at a pressure of 100 mm. Hg maintained for two hours. This degree of compression, moreover, causes much greater vascular disturbance in the muscle than in the skin and subcutaneous tissue, with regard not only to vascular obliteration during the application of pressure, but also to the extent of subsequent reactive hyperæmia and increased capillary permeability as shown by localisation of injected dye or bacteria. Husain finds that these effects are more distinct with low pressure exerted for a long period than with higher pressure of short duration, while after ligation of the limb artery or transection of the spinal cord even lower pressures cause comparable muscle damage. While a pressure of 200 mm. Hg for two hours was required to induce muscle degeneration in normal guineapigs, muscle changes took place in scorbutic guineapigs after only 50 mm. Hg pressure applied for one hour.

It is thus clear that under experimental conditions mimicking those at pressure sites in a bedridden patient—local thrombosis, paralysis, vitamin-C deficiency—there is a lowered muscle threshold to the damaging effects of pressure. The evidence suggests that muscle is the site of the primary change resulting in bedsores.

MULTIPLICATION OF HERPES VIRUS

THE multiplication of herpes simplex virus is coming under very close scrutiny. Francis and Kurtz,[3] Bang,[4] and Ackermann and Kurtz [5] all put forward the view that the nuclear inclusions found in herpes simplex infection were a product of degeneration rather than actual virus. McNair Scott et al. [6] point out, however, that these workers did not consider the possibility that virus might multiply in the nucleus early in the course of infection, and be found later in the cytoplasm en route to the outside world. A study of the virus grown in epithelial cells of the rabbit's cornea in vitro has confirmed this explanation. Scott et al. conclude from this work and from their earlier studies of virus growing in the chick chorio-allantoic membrane [7] that virus growth is closely related to nuclear changes and that the virus itself is closely associated with the nucleus early in its growth, but not later in infection.

These conclusions are strikingly confirmed by Morgan et al.,[8] who examined by electron microscopy extremely thin sections of chorio-allantoic membranes infected with herpes simplex virus. Particles thought to be virus cut in section were found both in the nucleus and cytoplasm. The nuclear particles consisted of a central spherical body surrounded by a single membrane, whereas the cytoplasmic particles were generally slightly larger in diameter and usually had a double membrane. The suggestion from this work is that virus particles are first produced naked in the nucleus and receive some outer clothing in the cytoplasm to help them face the cold world outside.

If these results are confirmed and extended to other viruses, they will have most interesting implications with regard to virus growth in general. Indirect observations have led to many useful inferences about virus growth, but now direct observation is helping to expose many of the intimate details of virus multiplication.

THE PAYING PATIENT

As the amenities of the National Health Service improve, private practice is likely to diminish. At present, as we remarked last week,[9] many people prefer, as formerly, to pay for their treatment in hospital or nursing-home—whether because they want to be sure of being attended by a particular physician or surgeon, or for one of the other reasons we set out eighteen months ago.[10] So long as the standard of care obtainable by other people is not thereby reduced, there is nothing immoral in spending one's own money on privacy, on a telephone by the bedside, on the right to have visitors, or on the attendance of a doctor in whom one has special confidence; and those who want these things sufficiently should still be able to buy them—especially as this will incidentally mean a saving to the N.H.S.

Actually, of course, the expense of illness is so high that comparatively few people can afford private treatment unless they take out some form of pre-payment insurance which will meet part or all of the cost. That there is a real demand for such insurance is shown by the progress of the Hospital Service Plan put into operation ten years ago by the London Association for Hospital Services; and the demand would certainly be greater if more people knew how little they have to pay for this kind of cover. Just as this association started in London but now offers its benefits to anyone living in Great Britain or Northern Ireland, so the similar non-profit-making provident association which started in Bristol [11] places no restriction on the place of residence of those who join it. Both schemes cover the contributor's wife and family as well as himself, and both have special arrangements for doctors. For those of us who unexpectedly find ourselves taking up a good deal of the time of medical or surgical colleagues, and are anxious that their help should have some kind of material recognition, the problem can often be acceptably solved with a cheque sent by the London Association for Hospital Services rather than by ourselves; and in Mr. T. W. Place the association has a secretary whose letters, whether to contributors or their medical attendants, keep such transactions on a human rather than an official level.

To mark the tenth anniversary of the Hospital Service Plan, the association last week held a reception at B.M.A. House, at which Sir Russell and Lady Brain received the guests. By way of celebrating this decade of useful work, we publish on p. 618 a brief summary of the scheme in the form it has now reached.

1. Groth, K. E. *Acta chir. scand.* 1942, **87**, suppl. 76.
2. Husain, T. *J. Path. Bact.* 1953, **66**, 347.
3. Francis, T., Kurtz, H. B. *Yale J. Biol. Med.* 1950, **22**, 579.
4. Bang, F. B. *Bull. Johns Hopk. Hosp.* 1950, **87**, 511.
5. Ackermann, W. W., Kurtz H. B. *J. exp. Med.* 1952, **96**, 151.
6. Scott, T. F. McN., Burgoon, C. F., Coriell, L. L., Blank, H. *J. Immunol.* 1953, **71**, 385.
7. Scott, T. F. McN., Coriell, L. L., Blank, H., Gray, A. J. *Ibid*, p. 134.
8. Morgan, C., Ellison, S. A., Rose, H. M., Moore, D. H. *Nature, Lond.* 1954, **173**, 208.
9. *Lancet*, March 13, 1954, p. 555.
10. *Ibid*, 1952, ii, 229.
11. The Western Provident Association for Hospital and Nursing Home Services Ltd. Head Office: Royal London House, Queen Charlotte Street, Bristol 1.

AMMI VISNAGA

GLYCERYL trinitrate is a valuable drug for relieving the acute anginal attack. But there is need also for a drug with a longer and more selective vasodilatory action on the coronary arteries, to reduce the frequency of anginal attacks. The early work of Anrep and his colleagues in Cairo [1–4] raised the hope that such a substance had been found in khellin. This is derived from the fruit of the umbelliferous plant *Ammi visnaga*, which grows wild in many Mediterranean countries. Experience with khellin has, however, disappointed many clinicians,[5–7] though others have found it valuable.[8] Its disadvantage is that, given in doses large enough to dilate the coronary vessels, it commonly causes unpleasant side-effects such as nausea, vomiting, dizziness, headache, and mental depression.[9] When pure crystalline preparations of khellin are given such effects are less prominent.[10 11] Extracts made from *Ammi visnaga* contain other pharmacologically active substances in addition to khellin.[8 12 13] One of these has been prepared in crystalline form and given the name visnagane.[13–15] So far very few pharmacological observations of this product have been recorded, but it is apparently some eight times more active than khellin in dilating the coronary arteries of the isolated heart of the rabbit [15] and in inhibiting smooth-muscle spasm in the guineapig intestine.[16] It is a long way from kymograph to cardiograph, but, in the quest for a coronary vasodilator suitable for clinical use, visnagane seems to deserve further study.

SUPERIOR VENA CAVAL OCCLUSION

SUDDEN occlusion of the superior vena cava results in cyanosis and massive œdema of the face, neck, and upper extremities, together with a feeling of fullness or congestion in the head on stooping. Within a few weeks the signs gradually subside as an efficient collateral circulation develops. The named veins that mainly form the by-pass for blood from the superior to the inferior vena cava are the internal mammary, thoraco-epigastric, azygos, and vertebral; on inspection and infra-red photography the large subcutaneous collaterals are clearly visible over the shoulder, chest, and abdomen. The venous pressure in the upper half of the body is significantly raised, especially on exercise.[17] The body tolerates this surprisingly well; the patient may be symptom-free, and no instance of cerebral or ophthalmic vein rupture has yet been reported.

The site and sometimes the nature of the occlusion can be established by phlebography.[18] Radiographs are taken during and immediately after the injection of 20–30 ml. of 70% diodone ('Diodrast') into the basilic or external jugular vein. Satisfactory films reveal the pattern of the collateral circulation and the level of the caval obstruction, and they make it possible to distinguish external compression—e.g., from an aortic aneurysm—from the infiltration of a bronchiogenic carcinoma. Unfortunately the lesions responsible for superior vena caval obstruction are nearly always progressive and irremediable. Of Schechter's [19] 22 cases 18 were found to have carcinoma of the lung, and in 15 of these the growth arose from the right main stem or right upper lobe bronchus. The superior vena cava was involved in 11% of 210 histologically proved cases of bronchogenic carcinoma. Less common causes of compression are aneurysm of the ascending aorta, primary or secondary lymphadenopathy, and mediastinal inflammation.[20]

MALIGNANT CELLS IN SPUTUM

IN the past twenty-five years much work has been done on the examination of sputum for malignant cells, notably at St. Thomas's Hospital, London.[21–26] Such cells are detectable in the sputum or bronchial secretions in about three-fifths of patients with bronchial carcinoma. Jennings and Shaw,[27] for instance, found them in 240 out of 395 cases at the London Chest Hospital. Without sputum examination only 45% would have been histologically confirmed before operation or death; but examining the sputum raised the proportion to 82%.

From this it might seem that sputum examination should be very valuable. But much experience is needed to distinguish carcinoma cells from others in bronchial exudates; and Jennings and Shaw believe that, even with specially trained observers, about 2% of false-positive reports is inevitable. Furthermore these workers regard the investigation as inadequate if less than six specimens are examined; and, although the staining method they advocate is rapid and simple, many busy laboratories might be unable to examine so many specimens. For the best results the sputum would have to be examined routinely in all patients suspected of having bronchial carcinomas. Perhaps the same number of positive results could be obtained with fewer specimens, by homogenising and concentrating the sputum in some way that did not interfere with the staining properties of the cells.

The method used by the St. Thomas's workers gives preparations that last many years. That employed by Jennings and Shaw is quicker and simpler, but the films must be examined within a few hours. The Papanicolaou method,[28] although giving permanent preparations, is laborious, and very few laboratories in this country could spare the time to apply it on a large scale. Indeed, examination of sputum by any method seems unpopular with pathologists, and many clinicians regard it as quite unreliable. This is a pity, for it seems potentially valuable; for instance, malignant cells have been reported in almost two-thirds of cases in which the tumour was of the peripheral type and beyond the range of bronchoscopic vision.[27]

The main technical difficulty is in obtaining large enough aggregates of cells to recognise malignancy with confidence. This applies also to the examination of pleural fluids. Pulvertaft et al.[29] examined living cells from this source by phase-contrast microscopy; by their technique the cells, though kept alive, did not reproduce. Sano,[30] on the other hand, studied the growth-patterns in tissue-culture and found that sometimes malignant cells could be recognised more easily in this way than by smears or blocks of the sediment. These

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methods may possibly be applicable to sputum examination, but they will probably need even more experience and be even more time-consuming than those already in use.

A DISEASE OF CIVILISATION?

Two American papers [1 2] recount an odd story which will interest the nutritionist. During the past two or three years quite a number of infants 2–4 months old have been admitted to hospitals up and down the United States because of convulsions for which there was no apparent cause. A comprehensive "work-up" yielded consistently normal results.[2] The investigators then turned their attention to the infants' environment, and found that before admission to hospital all had been receiving the same proprietary infant food, consisting of defatted cow's milk, animal fats, vegetable fats, iron, and vitamins. This was then prepared according to the formula and was analysed; and it proved deficient in vitamin B_6. 1 litre of the formula containing less than 60 μg. of pyridoxine hydrochloride. Deficiency of this vitamin was already known to cause convulsions in man,[3 4] and so the problem was solved. Pyridoxine was administered to the babies, and there were no more fits. The vitamin has now been added to the proprietary milk.

STATUS THYMOLYMPHATICUS

IT is always agreeable to assist in the obsequies of a medical myth, particularly if one is sure that it is dead. Willing hands are again trying to lay status thymolymphaticus to rest.[5–7]

The concept of lymphoid and thymic hyperplasia accompanied by a liability to sudden death came to the fore in Vienna at the end of the last century. Though backed by no convincing pathological evidence, the idea gained ground, and ten years later it began to appear in British textbooks. In 1911 a separate column was first allotted to diseases of the thymus in the annual report of the Registrar-General. Since then many attacks have been made on it, the most authoritative being that of a joint committee of the Medical Research Council and the Pathological Society of Great Britain, which in 1931 reported, after a careful study of 680 necropsies, that "there is no evidence that the so-called status thymolymphaticus has any existence as a pathological entity." [7]

Littleton et al.[6] have examined one of the five hypotheses accounting for death in "status thymolymphaticus"—namely, that the thymus can compress the trachea and lead to suffocation. In careful anatomical and radiographic studies they found no evidence suggesting that this might happen even if the gland were enlarged or abnormally placed. In the young, radiography of the thymus can be very difficult; the range of normal is wide, and there is no absolute measure of enlargement. The vascular shadows in the infant's mediastinum vary greatly in shape and width, especially if the film is taken in expiration or while the child is screaming (a glance at the jaw may help to settle this point). Screening is always advisable in the doubtful case, but lateral views of the chest are seldom helpful. It has long been uncertain whether a normal thymus can be seen, but it is now generally agreed that the small triangular projections from the mediastinum—the so-called sail shadows—can represent the edges of a normal thymus. Sometimes slight scoliosis or a mediastinal shift, secondary to collapse or agenesis of lung, may possibly displace the gland and cause its profile to appear.

Until these points were recognised, thymic enlargement was commonly diagnosed, and radiology was thus on the side of those who wish to keep status thymolymphaticus alive or at least unburied. Among these, Ucko [8] has lately suggested that thymic and lymphoid hyperplasia reflects pituitary-adrenocortical deficiency; and Neale [9] remarks that in a morbid-anatomical study of cases of status thymolymphaticus he found that the adrenal glands were commonly small. Neale suggests that a skilled team should investigate the adrenocortical reserve of patients with suspected status thymolymphaticus. So the would-be interrers once more find their way barred.

ASPIRATION BIOPSY OF THE LIVER

THE present method of aspiration biopsy of the liver was introduced by Iversen and Roholm [10] in 1939. Zamcheck and his colleagues [11 12] have now appraised this investigation. Among 20,016 patients who underwent aspiration biopsy the mortality was 0·17%; and excluding cases which by today's criteria would not be submitted to it the mortality was 0·085%. Schiff [13] and Haex [14] had not a single fatality in 2800 cases. The principal risks are hæmorrhage due to tearing of the liver, and bile peritonitis from perforation of a distended intrahepatic duct. This second complication has been recorded only in association with extrahepatic biliary obstruction; so the signs of bile peritonitis after aspiration biopsy are a strong indication for immediate laparotomy.

An impressive list of the diseases in which this investigation has been essential for diagnosis in individual cases includes amyloidosis; Gaucher's disease; Kinnier Wilson's disease; hæmochromatosis; various granulomatous lesions, including tuberculosis, leprosy, brucellosis, and sarcoidosis; fungal infections; infectious mononucleosis; leptospirosis; toxic hepatitis; lymphomas; leukæmia; and many of the parasitic infections, such as kala-azar, hydatid disease, and schistosomiasis. von Falkenhausen et al.[15] suggest that liver biopsy be considered in all obscure cases where a definite diagnosis has not been reached by other methods. Biopsy has revealed the uncertainty of clinical diagnosis of liver disorders even when based on a complete history, physical examination, general laboratory and liver-function tests, and radiographic examination. Thus Berk and Shay [16] found that in 12 out of 45 cases the diagnosis had to be changed as a result of the biopsy; and Moyer and Worl [17] found that almost a third of their patients diagnosed clinically as having cirrhosis in fact had only fatty liver without fibrosis. Perhaps the greatest diagnostic value of aspiration biopsy is in differentiating between "medical" and "surgical" jaundice, since "surgical" jaundice requires urgent operation, which in "medical" jaundice is strongly contra-indicated and is associated with a high mortality. Although usually this differentiation is fairly easy, in about 15% of cases an exact diagnosis is impossible without histological examination. With few exceptions this establishes the difference, especially in the early stages. Procrastination is to be avoided since as time goes on the characteristic parenchymal changes of hepatitis tend to be obscured and the danger of biopsy in obstructive jaundice increases.

Against the potential dangers of needle biopsy have to be set its advantages. In 46 of 6062 necropsies at the Mallory Institute of Pathology [18] unsuspected gall-stone obstruction of the common bile-duct was found, and in

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four-fifths of these cases the biliary disease was a major factor in causing death. This suggests that the usefulness of needle biopsy may far outweigh its potential risk.

DIABETIC NEUROPATHY

THE commonest neurological complication of diabetes mellitus is peripheral neuropathy, which mainly affects sensory fibres but occasionally involves motor fibres.[1] Garland and Taverner,[2] however, have drawn attention to an unusual motor syndrome which was originally recognised by Bruns [3] in 1890. 5 patients with recent diabetes, aged between 56 and 73, had severe usually asymmetrical pain in the legs, particularly around hips and thighs; in all 5 there was muscle wasting with loss of tendon-jerks in the legs but no objective sensory impairment. 3 of these patients had extensor plantar responses at some stage of the illness, and a 4th had an equivocal response; in 4 the protein content of the cerebrospinal fluid was 100–120 mg. per 100 ml. In 4 patients the neurological condition improved with control of the diabetes; but in the 5th, who apparently did not coöperate, the condition remained stationary. Garland and Taverner consider that the lesion is in the spinal cord rather than the peripheral nerves, and tentatively suggest that it may be due to atheromatous changes in the spinal vessels. The absence of other signs of vascular disease and the improvement with treatment seem to be against this hypothesis; but, whatever the cause of this complication, its recognition is important since it might easily be mistaken for more serious forms of spinal-cord disease. This syndrome certainly differs from the diabetic myelopathy described by Williamson [4] in 1904, where the major pathological changes were in the posterior columns and intramedullary portions of the posterior roots.

Neuropathic arthropathy has only recently been recognised as an occasional accompaniment of diabetic neuropathy. Bailey and Root [5] in 1947 described painless destruction of the tarsus in 14 patients, and the condition is now being recognised more frequently.[6–8] Ideas about the cause of neuropathic arthropathy in its classical setting of tabes dorsalis or syringomyelia have veered away from Charcot's original suggestion of a disturbance of trophic nerves; the changes are now thought to result from repeated minor traumata and from weight-bearing in a joint deprived of normal sensation. Arthropathy is perhaps to be expected in diabetic neuropathy, for in this, as in neural leprosy, where neuropathic joints are also found, there are severe sensory changes with relatively little motor weaknesses, and thus the patient can continue walking on his insensitive mid-tarsal joints. This, however, may not be the whole explanation. Lister and Maudsley,[7] who examined one such joint pathologically, found gross impairment of blood-supply to the foot; while Martin [9] noted that soft-tissue lesions, such as perforating ulcers, were or had been present in 8 out of 9 cases. There seems no doubt that true neuropathic arthropathy may arise in diabetes, but in some cases there may be vascular and infective factors.

The cause of neurological complications in diabetes has long been disputed; and Martin,[9] in a survey of 150 patients from King's College Hospital, has made a further attempt to solve this problem. One view is that nerve damage results from ischæmia due to peripheral vascular disease; and Broch and Klövstad [10] concluded, from a careful study of patients in Oslo, that the neurological symptoms "are in some way or other a consequence of circulatory disturbances." Martin investigated first the association of neuropathy with diabetic retinopathy and diabetic renal disease—two conditions generally regarded as manifestations of the same vascular process. Retinal change was found in a third of the patients with neuropathy, but Martin did not think that this prevalence was greater than that in non-selected diabetics without neuropathy. In only 2 of the series was diabetic renal disease present in association with neuropathy: this association was no commoner than in a series of diabetics without neuropathy previously described by Scott.[11] Martin's other arguments against the vascular origin of diabetic neuropathy are more convincing. Oscillometry in 20 cases showed no abnormality except in 2, where there was obvious clinical evidence of vascular disease. The effect of intravenous tolazoline hydrochloride ('Priscol') on peripheral vasodilatation, as shown by increased temperature in the toes, was studied in the same 20 patients and gave evidence of adequate vasodilatation in 18. Clinicians who recall that some diabetics show severe neurological involvement but no evidence of vascular disease, and others gross ischæmia but few, if any, abnormal neurological signs, will readily accept Martin's conclusion that vascular disease is not important in the ætiology of neuropathy.

Thiamine deficiency has been named as a causal factor, but so far without convincing evidence. In 12 patients Martin, besides controlling the diabetes, gave large doses of thiamine for up to three months; but improvement was no more rapid than in patients who received no additional thiamine. He also investigated the removal from the blood-stream of sodium pyruvate, and found that in patients with diabetic neuropathy the results did not differ from those in normal controls. Having excluded vascular disease and thiamine deficiency as causes of diabetic neuropathy, Martin concluded that it is due to the disordered metabolism of diabetes mellitus but that no more precise explanation is yet possible. He has previously suggested, on the basis of vasomotor and sweating tests, together with histological examination of biopsy specimens, that non-medullated fibres are the first to be implicated in diabetic neuropathy.[12] Martin's survey suggested that neuropathy occurs particularly in relatively mild, long-standing diabetes which has not been treated or has been inadequately controlled, and that it is uncommon in patients who have had acute complications such as ketosis. This survey has also confirmed that occasionally neuropathy develops after diabetes has been brought rapidly under control.

Prof. R. I. HARRIS (Canada) and Dr. DONALD HUNTER (Great Britain) have been appointed Sims Commonwealth travelling professors for 1955. Professor Harris is to visit Great Britain, Australia, and New Zealand, Dr. Hunter Canada and Rhodesia.

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The Wider World

AFRICAN JOURNEY

A Physician's Impressions of a Trip from Cape Town to Cairo

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LAST year, on my journey from Cape Town to Cairo, which took about 3½ months and covered 20–30 thousand miles, I visited medical schools and hospitals in South Africa, Rhodesia, East Africa, and the Sudan, and I was able to study the medical services in each of these lands. Naturally I also heard much about the background against which these services work.

ECONOMIC AND POLITICAL PROBLEMS

The main causes of the present unhappy state of Africa appear to me to be similar to those which operated in Britain a hundred or more years ago, in Russia, Poland, Hungary, and certain other parts of Europe immediately before the first world war, and in India, Burma, Indonesia, and China before the second world war. They can be divided into three main groups:

1. As a result of the reduction of famine, pestilence, and tribal war, the fertility of the people has outstripped the fertility of the soil. Hence the food-supply of large sections of the community is gravely endangered, the standard of living is lowered, and there is dissatisfaction and unrest.

2. The introduction of education, even in its most elementary form, has enabled thousands of Africans to read the newspapers and to listen to radio broadcasts; and the transportation of hundreds of thousands of Africans from their distant kraals to work in the industrial cities in South Africa, Rhodesia, and East Africa has created a demand not only for a greater share of the country's wealth but also for a greater say in its government.

3. The white people in Africa, who have done so much to develop the country and who have made their homes permanently in Africa, are outnumbered by the Africans in the ratio of 3 : 1 in South Africa, 30 : 1 in the Central Federation of the Rhodesias and Nyasaland, and 300 : 1 or more in East Africa. Advice from Great Britain to give the Africans a greater political share in the running of their country gives rise to grave apprehension. It is probably true that many white people in Africa do not sufficiently recognise the contribution that African cheap labour has made to the prosperity of the country.

Meanwhile these different territories find ever-increasing difficulty in meeting the Africans' demands for more and better educational, social, and medical services. To all intents and purposes the African pays no direct taxes other than a small poll tax of £1 per annum or less. He pays no taxes because he is usually so poor that he has only the bare necessities for supporting life. To provide for these extended services for Africans additional revenue is needed. This money cannot be obtained from the small number of white people resident in most of these territories, and the only alternatives are (1) that it should be found by the British taxpayer, and (2) that the number of African taxpayers should be increased by encouraging the training of a new class of African tradesmen and business and professional workers. In South Africa and Rhodesia the latter development is disapproved by many white trade-unionists, who are desperately afraid of the effects of this policy on their high standard of living.

The unsatisfactory conditions of Africans are very similar from Cape Town to Cairo, and their improvement largely depends on a solution of the agrarian problem—namely, how to increase the fertility of the soil at a greater rate than the fertility of the people. A series of vicious circles must be broken if happiness and prosperity are to come to the African peoples. They are ill fed because their output of work is low, and their output of work is low because they are ill fed. They are poor because they are diseased, diseased because they are uneducated, and uneducated because they are poor. The land is ruined because the people are backward, the people are backward because the land is ruined. And so on *ad infinitum*.

Medical Services

UNION OF SOUTH AFRICA

The four *provincial governments* of the Union are the legal authorities responsible for the provision, maintenance, and staffing of the general hospitals in all the large cities. The costs of running these hospitals are met mainly by funds from the provincial and central governments and to a lesser extent by fees from patients. If a European patient is unable to pay for hospital treatment he must undergo some sort of means test or produce a certificate from a doctor, magistrate, or minister of religion stating that he cannot afford medical fees; this will allow him to receive free hospital care and maintenance. Almost all African patients are classified as indigent and hence receive free medical services.

In these general hospitals the doctors do not charge the patients for treatment. The staff of provincial hospitals for European patients is selected in much the same way as the honorary staff of a voluntary hospital in Great Britain was selected before 1948. As part-time consultants they receive a sessional fee which they augment by private practice in their consulting-rooms, in private nursing-homes, and private hospitals. The junior hospital staff from the registrar rank downwards is full-time.

In some cities, such as Johannesburg and Durban, the African hospitals are separate institutions from the European hospitals. Their consulting staff is European and the members are paid by the provincial government on a full-time basis of £2000–2500 per annum. As these full-time physicians are not allowed to do private practice, they are not so well off as their part-time colleagues. They are also largely cut off from teaching, though they are in fact doing excellent work both in the care of patients and in clinical research. Where there are African wards or blocks as part of a general European hospital then the part-time European staff cares for both the African and European patients.

The European hospitals are comparable to the average provincial hospitals in Great Britain, but they are, of course, antiquated compared with many of the newer hospitals in America, Sweden, or Switzerland. The African hospitals all over Africa are usually overcrowded and with certain notable exceptions less well constructed than the European hospitals. They are also less well equipped with apparatus and laboratory facilities, and with nursing and technical staff.

The *central government* controls medical services connected both with the prevention and cure of disease; for instance, the department of health administers, staffs, and maintains hospitals for tuberculosis, leprosy, and venereal diseases. Again it pays full-time medical officers in some native reserves. It also pays—mainly on a part-time basis—district surgeons who are general practitioners in small towns, and these doctors undertake medicolegal work for the central government and also provide free domiciliary medical services for the indigent. The central government by 1950 had started 33 health centres and many sub-centres in native reserves and in big cities where there is a large native population. The medical work done in these centres is preventive, curative, and educational.

Local authorities, acting through their medical officers of health, are responsible, as in Britain, for the public

health of the community, including the sanitation and hygiene of their city or country and the prevention and control of infectious diseases. Members of the staff of the medical officer of health conduct outpatient clinics for maternity and child welfare, tuberculosis, and venereal diseases. The local authorities' part in building and administering hospitals is less important than that of the provincial administrations or the central government. But in most of the large cities, hospitals for the prevention and treatment of infectious diseases, venereal diseases, and tuberculosis have been provided by local authorities who recover most of the costs from the central government.

At present, there are three *medical schools* in South Africa—at Cape Town, Johannesburg, and Pretoria, the last being an Afrikaans-speaking school. A new Afrikaans medical school is about to open at Stellenbosch, about 40 miles from Cape Town. A new hospital and medical school for Africans and Asians has been built in Durban.

The present output of European doctors is about 300 per annum, which is more than is needed for the $2^1/_2$ million Europeans in South Africa. This has led to excessive competition between doctors especially in the big cities. But if there were more money to pay for better medical services for Africans, all the doctors at present in practice, and many more, could be employed. It is estimated that about 80–90% of Africans are still treated by witch-doctors, but every year more and more are seeking advice and treatment from European doctors.

Clinical *research* is carried on in all medical centres in South Africa, but Johannesburg has the best equipped and staffed institutes.

RHODESIA

All the *hospitals* in Rhodesia are built, owned, and administered by the Rhodesian government. The larger European hospitals at Bulawayo and Salisbury are well constructed and excellently equipped. All the European patients have to pay for their hospital keep and services and also fees for the doctors' attendance. There is no such thing as an "honorary staff" in the European hospitals in Rhodesia. All registered doctors in the cities of Bulawayo and Salisbury can continue to care for their patients when they are admitted to the government hospitals. Thus in Salisbury (a city of some 45,000 people) more than 100 doctors attend patients in the main hospital—more than the total number of nurses in the hospital. African patients in Rhodesia are cared for in separate hospitals which are generally antiquated and overcrowded. The staff of these hospitals is drawn from the Rhodesian Medical Service and most of them are paid on a full-time basis.

There are no universities or *medical schools* in Northern or Southern Rhodesia or Nyasaland. An integral part of the new scheme of federation is the development of a Central African University, open to African, Asian, and European students. The foundation stone was laid by the Queen Mother last year.

Private practice.—Competition for family and specialist practice in Rhodesia is keen, for there is about 1 doctor to every 300–400 Europeans. Syndicates or partnerships of both general practitioners and specialists are becoming increasingly common. Many believe that this combination is not in the best interests of the medical profession or their patients.

In view of the competition for the small amount of private practice available in South Africa, Rhodesia, and Nairobi and district at the present time, I believe it would be unwise for any medical graduate to leave Great Britain to practise in these territories without first having secured a post either in an established practice or in the government medical service.

EAST AFRICA

East Africa, which comprises the territories of Tanganyika, Kenya, and Uganda, has an area of 650,000 square miles. The population consists of approximately 18 million Africans, 180,000 Asians, and 55,000 Europeans. Excepting in Nairobi and the adjacent district of the White Highlands, where some 30,000 Europeans have settled, most of these vast territories are so scantily populated by Europeans that there is almost no opportunity for private practice. Nearly all the medical work, including the specialist work in all types of hospitals, is undertaken by doctors belonging to the Colonial Medical Service. Only in Nairobi and district is private practice carried on to any extent, and in this region the profession is overcrowded. Large numbers of Indian doctors look after the health of the Asian community.

The total revenue of East Africa is stated to be between £30 and 40 million per annum, of which about a tenth is allocated to medical services. This amount is totally inadequate to provide Western medicine for even a minority of the 18 million Africans living in these territories should they desire medical advice and treatsent from European doctors. Similarly, wonderful opportunities for research into the prevention and treatment of disease are not being fully grasped, for lack of adequate research institutions, staff, and equipment. The dramatic results of penicillin, the sulphonamides, and the new synthetic drugs in the treatment of tropical diseases are rapidly convincing the Africans that Western medicine is an improvement on the medicine of the witch-doctor. Up to 1000 patients daily attend the outpatient department of the Mulago Hospital, Kampala, and the demands by Africans for better educational and social services are also rapidly increasing.

Medical education.—Makerere University and Medical School at Kampala, Uganda, is the only university in East Africa. It is playing an ever-increasingly important rôle in training Africans to take their share in running their own country.

THE SUDAN

At the Kitchener Medical School at Khartoum I saw great activity in the building of new departments for the basic sciences, as well as a new general hospital. Until recently the hospitals in the Sudan were staffed solely by doctors who were members of the Sudan Medical Service. In 1952 full-time professors in medicine, surgery, and midwifery were appointed to the medical school in Khartoum. The number of students is being raised from about 10 per annum to about 30 per annum. The clinical standard attained by final-year students whom I examined in the hospital wards seemed to be on a par with that obtaining in this country.

Witch-doctors

A medical specialist in Rhodesia who had made a special study of witch-doctors and had taken an excellent coloured film showing how they carried out their professional duties, assured me that by and large they were a respectable and responsible body of men and, as is not generally realised, women. On the whole, they carry out their work conscientiously. It is believed that 80–90% of all Africans are treated by witch-doctors at the present time. Their art and practice can be passed down from one generation to another of a particular family or it can be acquired through the system of apprenticeship.

African patients who have obvious causes for an illness such as an injury to an external part of the body are able to understand the reason for their sickness and hence can usually be successfully treated by the local application of fomentations and a bottle of medicine. When their illness is due to internal causes which are not visible, such as headache or pleurisy, the African patient usually ascribes his illness to being bewitched by some enemy. The only way of being relieved of the evil spirit which has entered his body is to have it removed by a witch-doctor. Unless the patient can be convinced that the evil spirit has been removed, he not infrequently

lies down and dies. European doctors who understand this African belief told me that they had on occasions called in witch-doctors to help to cure psychological disorders in Africans which had failed to respond to European methods of treatment, and that the witch-doctor sometimes succeeded where the European doctor had failed.

The Diseases of Africa

If it could be established that certain diseases were relatively rare in Africans compared with Europeans or Asians living in the same district, this would open new lines of research into their ætiology, because the basic cause of this difference in incidence must be conditioned either by racial and constitutional factors or by environmental factors—such as diet, housing, associated infections. Accordingly, I sent a memorandum to all the medical centres from Cape Town to Cairo which I was going to visit, and at the end of my lectures and ward rounds in each centre we held a clinicopathological conference at which physicians and pathologists gave their views on the comparative incidence of diseases in Africans and Europeans.

It is, of course, true that their opinions were based mainly on clinical experience and on clinical impressions which were unsuitable for statistical analysis. If proof based on statistical data is to be obtained, additional medical personnel and secretarial staff would be needed. The language difficulty, and the difficulty of cross-examining Africans, whose memory of past events is notoriously weak, can be largely overcome if time is taken at the medical interview and if an African medical assistant is in attendance. It is hard to get a proper cross-section of the African population for comparison with the European population, as the data available for Africans are mainly collected in the large African hospitals in the big European cities. There are great tribal variations in the African workers who are employed in these cities, and in general the older age-groups are not adequately represented. Despite these difficulties, I believe that if the same views are repeatedly expressed by clinicians and pathologists living in widely separated regions, they probably represent the true facts of the situation.

Data acquired at many conferences have convinced me that a number of diseases are much rarer in Africans than in Europeans.

"UNAFRICAN" DISEASES

(1) *Gastro-intestinal Diseases*
- (*a*) Gastric and duodenal ulcers.
- (*b*) Gastric and intestinal malignant disease.
- (*c*) Appendicitis.
- (*d*) Cholecystitis and gall-stones.

Peptic ulceration of the stomach is relatively uncommon in Africans, but its two most serious complications—hæmorrhage and perforation—are so rare that many physicians and surgeons who had spent years in Africa told me that they had never met them. The same was true of gall-stones, with the exception of pigment stones due to the chronic hæmolytic processes associated with malaria.

(2) *Vascular Disorders*
- (*a*) Angina pectoris.
- (*b*) Coronary thrombosis.
- (*c*) Peripheral vascular disease.
- (*d*) Cerebral thrombosis and hæmorrhage.
- (*e*) Essentlal hypertension.

So rare is classical coronary thrombosis in Africans that I did not see a case in any hospital which I visited. On the other hand, I often saw cases of hypertension. Many of these were undoubtedly secondary to renal disease which commonly occurs in Africans as a late result of the nephrotic syndrome (type II Ellis) or of pyelonephritis. Acute diffuse glomerular nephritis (type I Ellis) is very uncommon. There was general agreement that hypertension for which no cause can be found—i.e., essential hypertension—was not uncommon in Africans in contradistinction to the extreme rarity of coronary thrombosis. This finding suggests that the ætiology of the two conditions is different. Many explanations have been advanced for the rarity of vascular disorders in Africans, but I am satisfied from information received from physicians and pathologists who have examined the vascular tree at many necropsies that the essential reason is that atheroma is less common and less severe in Africans than in Europeans of comparable age-groups.

(3) *Rheumatic Diseases*
- (*a*) Rheumatic fever and its cardiac complications occur in all parts of Africa, but much less commonly in Africans than in Europeans or Indians. Acute rheumatic fever seems to be commoner in Cape Town, Johannesburg, Rhodesia, and the White Highlands of Kenya where variations in climate and temperature are greater than in coastal tropical districts such as Durban, Mombasa, and Dar-es-Salaam.
- (*b*) Rheumatoid arthritis is so rare in Africans that I never saw a single case in any hospital.
- (*c*) Osteo-arthritis is neither so common nor so severe in African males as in Europeans. This may be due to the fact that obesity is uncommon in African males and that women undertake a large share of the heavy manual work on the farms.

(4) *Endocrine Diseases*
- (*a*) Toxic goitre is extremely rare, though simple colloid goitre is common in some areas such as the north-east part of the Belgian Congo.
- (*b*) Diabetes is not uncommon in Africans but much less so than in Indians or Europeans.

(5) *Anæmias*
- (*a*) The megaloblastic anæmias are rare in Africans, though quite common in Indians in Africa, particularly in pregnant Indian women.
- (*b*) Iron-deficiency anæmia is common among Africans, but its degree and frequency are more closely related to associated diseases—such as hookworm infestation, bilharzia, and malaria—than to dietary deficiency of protein and iron.

(6) *Psychosomatic Disorders*

If it be accepted that such diseases exist, then duodenal ulcer, thyrotoxicosis, and rheumatoid arthritis are the best-known examples. All three diseases are extremely common in Europeans and very rare in Africans. This finding may be correlated with observations which, I am told, were made during the war—namely, that African soldiers under stress suffered from hysteria and not from the anxiety neuroses so common in Indians and Europeans under stress, which are believed to be the underlying cause of the so-called psychosomatic diseases.

"AFRICAN" DISEASES

Diseases which are much more common in Africans than in Europeans are:
- (1) Diseases of the liver.
- (2) Nutritional diseases.
- (3) Tropical diseases.
- (4) Respiratory diseases, especially those due to the pneumococcus and the tubercle bacillus.
- (5) Venereal diseases.

ENVIRONMENT AND RACE

I have been told by doctors who have practised in America and by European and Indian doctors who have practised in India that diseases which are rare in Africans now living in Africa are also rare in Africans and Indian peasants living under poor conditions in America and India, but that when Africans and Indians become successful and adopt European customs, eat the same kind of food, and are submitted to the emotional strains of modern civilisation, the incidence of vascular, gastro-intestinal, and endocrine diseases among them shows a remarkable increase. If these observations are true they suggest that environmental factors rather than racial factors are largely concerned in the ætiology of these diseases.

Environmental factors, such as bad housing, nutritional deficiency, or infection, do not appear to play an essential part in the causation of those diseases which are rarer in Africans than in Europeans, since Africans are worse housed, worse fed, and suffer from infectious diseases, especially tropical diseases and helminthic infestations, much more often than Europeans living in the same district.

Two other causes may be responsible for the high incidence of certain diseases in Europeans—namely (*a*) the excessive consumption of calories or the excessive intake of some particular food such as fat or protein; or (*b*) an excessive or uncontrolled production of emotional stimuli due to the competition and stress of modern life. It is also possible that both causes are concerned in the ætiology of certain diseases, since emotional stimuli by affecting adversely the balanced production of hormones may lead to alterations in processes vitally concerned with the metabolism of food.

CONCLUSIONS

Intensive research is urgently needed to elucidate the reasons for the rarity of some diseases in Africans as compared with Europeans. Such an investigation might provide valuable information about the ætiology, prevention, and treatment of a large group of disorders whose incidence and medical importance appear to be increasing both in Europe and in America.

Special Articles

SURGERY OF THE HAND

FROM A CORRESPONDENT

THE 9th annual meeting of the American Society for Surgery of the Hand was held in Cleveland and Chicago on Jan. 21–23.

Dr. D. A. KELLY (Cleveland) said that it had been estimated that in 1952 hand injuries cost U.S. industry 600 million dollars. 70% of all the industrial plants surveyed in the U.S.A. had inadequate safety precautions; and in these 70% the accident rate was $2^1/_2$ times that in the 30% with adequate safety precautions. Hand injuries accounted for 19% to 25% of the compensation cases and 50% of the grand total of all injuries in industry. The cost of compensation to disabled people was 500 million dollars a year. The non-disabling injuries were said to be 80 times as common as the disabling injuries, and they totalled 40 million in a year; each required an average of 3 dressings, making a total of 120 million visits to a doctor, each costing a dollar. This brought the grand total of the annual cost to industry of hand injuries to over 600 million dollars. And the great majority of these injuries were preventable.

Dr. E. C. WECKESSER (Cleveland) discussed congenital subluxation of the thumb. He demonstrated two cases in which plaster-of-paris correction splints, applied for over a year in early childhood, had alone produced a complete cure.

Speaking about compression of the median nerve in the carpal tunnel, Dr. G. S. PHALEN (Cleveland) emphasised that when a thenar palsy had been present for over a year the chances of recovery after decompression were negligible. A sublimis tendon from the 4th finger should be transferred at the same time to supply opposition.

Dr. DARREL SHAW (Cleveland) described cases of successful primary flexor-tendon grafts in the treatment of flexor tendons divided in "no-man's-land"; and he demonstrated cases of severe Dupuytren's contracture successfully treated by a combination of surgery and cortisone.

Dr. FLAZEN (Cleveland) advised against sympathectomy for minor causalgia, except when frequently repeated nerve-blocks had shown that symptoms were relieved. He described two patients in whom psychoses had been precipitated by unnecessary sympathectomy.

Dr. R. E. CARROLL and Dr. T. H. TABER (New York) gave the results of arthroplasty of the proximal interphalangeal joint in 30 patients, with a follow-up of from six months to seven years. The method used was excision of the distal third of the proximal phalanx through a lateral approach, leaving the mid-phalangeal base alone. Wire extension was applied through the middle phalanx for six weeks, followed by gradual movement and physiotherapy. Results were good in 16 of the 30 cases; 3 were failures.

Dr. H. L. MCLAUGHLIN (New York) discussed internal fixation for fractures of the carpal scaphoid. The aim of this treatment was to avoid long periods of immobilisation in plaster-of-paris. He disagreed with the widely held view about the blood-supply to the proximal fragment: all proximal fragments bled freely. The important distinction to make was between the stable and unstable fractures: the stable ones were held in position by capsular attachments; the unstable could not be controlled even by complete immobility of wrist, thumb, and arm. Stability, therefore, was more important than avascularity of the proximal fragment. Screw pins were used for fixation, after the fragments had been transfixed by a guide wire passed through a double-barrel tube. The head of the screw was inset into the bone. Dr. McLaughlin had seen no avascular fragments in cases treated in this way. 5 patients with established non-union were treated by the screw method; function was completely restored and they were back at work in from one to six weeks after the operation, but there was no union. Patients with unstable displaced fractures were back at work in one to two weeks after screwing.

Dr. L. MAYER (New York) described the results of the Steindler operation for paralysis of the elbow. By transferring the muscles of the medial epicondyle to the front of the humerus, extension of 165° plus full flexion could be obtained. He preferred the Steindler operation to the use of the sternomastoid or the pectoralis muscle.

Dr. R. I. GONZALES (California) wondered whether the orthodox three weeks' immobilisation in apposition after nerve repairs was too long. Nerves had a good blood-supply and should therefore heal as quickly as skin. Measurements of tensile strength had shown that it reached 100% at 10 days, and at 18 days it was over 100%. But the tension applied was acute, not chronic, therefore these experiments may not be directly applicable to clinical repairs.

Dr. H. CONWAY and Dr. R. STARK (New York) had injected thorium dioxide into radial and ulnar arteries of cadavers. Arteriograms were then made of dissected skin and fat. The palmar skin was supplied by numerous small branches from the superficial palmar arch. The vessels ran vertically after perforating the fascia. In the centre was a triangular area of relative avascularity; the skin in this area was liable to slough after undermining, so this risk should limit the proximal dissection in the radical fasciectomy operation for Dupuytren's disease. Dr. H. MAY said he practised the radical operation of his old chief, Lexer, plus removal of skin, but most surgeons were more conservative, especially for older patients. Dr. Conway added that the skin supply from the palmar vessels was of a mosaic block pattern of arteriolar tufts, which were absent centrally, so the limited operation was the wiser.

Discussing primary hand repair, Mr. PATRICK CLARKSON (London), the guest speaker, pointed out the

important distinction between lacerations and crush injuries of the hand. Properly excised and snugly closed, lacerations healed in a week. The contusion injuries (of which the high-explosive injury was the most striking example) showed progressive œdema in the early stages and the viability of the deep tissues was impossible to assess. A snug closure by approximation often led to late ischæmic loss and severe deep infections. A simple skin dressing by split-skin graft was therefore often the safest method of closure for the open contusions. The natural healing period was nearly three weeks. For traumatic amputations of the digits, thenar and palmar flaps had been found to be the best method. They caused no complications in the donor site or stiffness in digits. This repair by like tissue gave the best-sensitised and best-looking pulps. A simple split-skin graft cover of the stump was the best alternative and the most reliable method of repair for traumatic finger amputations when a thenar or palmar flap method was not used.

Turning to digital repair by toe transfer, Mr. Clarkson described the operative technique and the results of transfer of 16 toes in 6 patients. He suggested that when a dorsal foot flap was used, the transfer of a toe or toes could be regarded as reasonably certain. There need be no orthopædic disability. By tendon attachment at the time of the transfer or by late tendon grafts, the transferred digit could be given movement. The techniques of these transfers must be improved, but even now the method was the only surgical means of providing a grip in selected cases of complete adactylia; and it could be claimed that a big-toe transfer was the best method for complete repair of a missing thumb.

For the treatment of extensive deep burns of the hand, Dr. HARVEY ALLEN (Chicago) preferred a thin split-skin graft for primary cover, with later thicker free-graft definitive repairs. He excised sloughs in the hand at 5 days. Chemical débridement agents—pyruvic and phosphoric acids and trypsin—were useful. He removed blebs at primary toilet. "Depth often dictates the final result"; and he was disappointed in results in very deep dorsal burns.

Dr. MICHAEL MASON (Chicago) described some successful median and ulnar nerve repairs. He did primary repairs when possible, but Dr. B. WOODHALL favoured secondary nerve repairs. Dr. BUNNELL advised primary repair in expert hands, "but if not done well do only skin suture" and a secondary repair. Successful ulnar repairs seldom restored adduction of the 5th finger; subcutaneous tenotomy of the proprius extensor of the 5th digit relieved this adduction deformity.

Mr. CLARKSON described the arrangements for dealing with hand injuries at Guy's Hospital. In this casualty department the "clean open injuries" had to be segregated from the "sick," and a separate preparation room and accident theatre were necessary for these open injuries. On their second attendance, ambulatory patients were treated by the same staff, but in separate accommodation reached through the ordinary outpatient entrance. Mr. Clarkson maintained that an intensive early course of lectures on the subject, with the help of photographs and diagrams in the operating-theatre, could enable medical students, with reasonable supervision, to treat most hand injuries. He described the results of this system at Guy's, emphasising that the majority of cases were minor injuries. The major-infection rate following these repairs by dressers was 1% or less. Minor infections were more common, but present results justified continuing the system for its value both in teaching dressers the best techniques for the handling of delicate tissues (in any department of surgery) and in encouraging medical students to accept responsibility.

CAPITAL EXPENDITURE ON HOSPITALS

THE Minister of Health announced last week (see p. 620) that hospital authorities may in future finance building schemes from any non-Exchequer funds ("free monies") they hold without, as hitherto, having these counted against their capital allocations from the Exchequer.

The removal of this restriction arises from the latest investment review and changes in licensing limits announced by the Minister of Works last November. It will still be necessary to obtain the Minister of Health's approval and a civil building licence for all projects costing more than £1000. In each such case the Minister will consider: (1) the extent to which the project involves maintenance expenditure from the Exchequer, and particularly any increase in such expenditure; (2) any effect of the scheme on property vested in him; and (3) the need for the project as part of the hospital service.

In Scotland, where the Hospital Endowments Commission is drawing up schemes for the reallocation and future management of endowments, regional boards—and not the Secretary of State—will adjudicate on proposals by boards of management to use "free monies" for building works.

In England and Wales "free money" comes from three sources:

1. Endowments carried over from before the start of the National Health Service. Each teaching hospital retained in 1948 the endowments it had held before the start of the service and has full discretion over their use for purposes relating to hospital services or research. At March 31, 1952, teaching hospitals held about £32 million from this source and from gifts since the start of the service.

2. Income from the hospital endowments fund. All endowments held by non-teaching hospitals before the service started were pooled to form this fund; and in 1952–53 the equivalent of 28*s*. per head was distributed.

3. Gifts since the start of the service to individual hospitals. These may be subject to specific trusts.

THE HOSPITAL SERVICE PLAN

THE object of the Hospital Service Plan is to enable people "to provide for hospital and nursing-home charges and fees by paying a very moderate annual contribution." It was started ten years ago by the London Association for Hospital Services, which has sought to achieve the most comprehensive possible scheme at a low cost to contributors. A non-profit-making body, the association is controlled by a council of management whose members are nominated by the three English Royal Colleges, the British Medical Association, and King Edward's Hospital Fund for London. The chairman of the council is Sir Russell Brain, P.R.C.P., and the members include Sir Cecil Wakeley, P.R.C.S., Sir Eardley Holland, F.R.C.O.G., Dr. C. E. Lakin, Miss Gwendoline Smith, F.R.C.S., Dr. Charles Hill, M.P., Mr. A. G. L. Ives (secretary of the King's Fund), and Lord Gifford.

Membership and Entitlement to Benefit

Anyone living in Great Britain, Northern Ireland, the Isle of Man, or the Channel Isles may become a member of the Hospital Service Plan, and benefit (in the form of refunds) is paid in respect of maintenance as an inpatient in the pay-beds or amenity beds of a hospital, or in a recognised nursing-home, anywhere in the United Kingdom—and likewise outside the United Kingdom for conditions that could have arisen in this country. Refunds are also made to inpatients for professional fees (including those for radiological and pathological investigation), and fees for radiotherapy, physiotherapy, and sometimes other forms of treatment; and they are made in respect of the full-time employment of a nurse or assistant nurse to look after the patient at home. Under an extended scheme "outpatient" consultations and treatment may be provided for.

Contingencies for which benefit is *not* payable are (*a*) normal maternity treatment; (*b*) treatment for injuries sustained in accidents where damages are recoverable from a third party, or where compensation is payable under an insurance policy; (*c*) treatment for war injuries; and (*d*)

the cost of medicines, drugs, surgical appliances, glasses, and dentures. Treatment for illnesses or operations "foreseeable at the date of application," or recurrences of past conditions, is excluded unless full particulars of these conditions have been given and the council have accepted the liability. Members become eligible for benefit thirteen weeks after enrolment.

Contributions

Three rates of contribution are offered—the "standard," the "augmented," and the "maximum." (Also, higher rates can be arranged for contributors wanting larger benefits.) The contribution at the "maximum" rate is £5 4*s.* per annum for an individual; £8 8*s.* for the contributor and one dependant (wife, husband, or other relative); and £10 10*s.* for the contributor and two or more members of his family (all but one of whom must be children under 18 or still being educated at the contributor's expense). When they cease to be eligible, dependants may join the scheme at a reduced rate of contribution.

Benefits

While full cover cannot yet be offered to all cases treated in hospital, an attempt is now made to provide what is virtually free treatment. When a contributor to the "maximum" scheme is treated in a hospital private ward where the professional fees are controlled by the Ministry of Health, the full amount incurred for maintenance and specialist services is refunded (except for tonsillectomy in the case of dependant children) up to a total payment of £210 in a contribution year. Contributors contracting pulmonary tuberculosis may now claim benefit for the cost of a stay in a recognised sanatorium.

As a "no-claims bonus," benefits are increased by 25% where none have been paid during the current contribution year or the two previous ones. As the number of contributors has grown, the association has several times been able to raise and extend its benefits as well as relaxing conditions of membership. With further growth, this process of improvement is likely to continue.

"Scheme for the Doctor"

A brochure with this title describes some minor but convenient adaptations of the Hospital Service Plan to suit members of the medical profession. Where a doctor or a member of his family is treated in a hospital private ward or in a nursing-home and is not charged professional fees, the amount of the benefit normally payable will, if he wishes, be sent by the association direct to the attending specialists, who are thus relieved of any embarrassment at being offered a fee by a colleague. (Naturally no benefit is payable in respect of professional fees where a contributor or his dependant is accommodated in an amenity bed and thus receives professional attendance under the N.H.S. But where a contributor or any of his registered dependants is treated in a general ward, the council may, at their discretion, make payments towards certain incidental expenses connected with the illness.)

Full particulars of the scheme may be had from the secretary of the London Association for Hospital Services, Tavistock House South, Tavistock Square, London, W.C.1.

Medicine and the Law

The Case of the Plaster Cast

LAST week Mr. Justice Stable awarded £5000 damages at Nottingham assizes in a case in which it was alleged that a six-year-old girl had become a cripple through the negligent retention of a plaster cast upon her left leg.[1] The defendants were the matron of the Gringley Children's Hospital (who was said to have ignored complaints conveyed by the child's parents and grandmother that the plaster cast was too tight) and the Nottingham No. 5 Hospital Management Committee. The medical officer of the hospital was not made a defendant, but the court allowed allegations of negligence on his part to be added to the particulars in the pleadings after the plaintiff's witnesses had given their evidence. It was complained that he failed to inform the orthopædic surgeon that the cast was removed, failed to call in a second opinion or to appreciate the serious conditions of the leg, and failed to prescribe adequate treatment.

The evidence may be summarised as follows. The plaster cast was placed in position, on what was then a clean and healthy limb, on Jan. 2, 1952; it was removed a fortnight later, after the matron had observed that the toes were turning blue. On Jan. 29 the matron became alarmed; the leg had "turned a green-bluey colour." On Feb. 24 an orthopædic surgeon saw the patient and had her transferred to another hospital for specialised treatment. The result of the tightness of the cast and of the absence of proper treatment was stated by plaintiff's counsel to be "the most appalling necrosis of the tissues, deformity of the left foot, paralysis of the muscles controlling toes, foot, and ankle, and the grossest possible disfigurement." One unhappy feature of the case was that the parents were not told of the serious condition of the child until the following June. The matron indeed had written them a reassuring letter. "They were not only kept in the dark," said the judge, "they were deliberately misled." The extent of the information to be given to a patient's relatives is a question common to all institutional or private treatment. Mr. Justice Stable seemed inclined to connect the regrettable secrecy in the Nottingham case with the National Health Service Act. "I would like to know," he remarked, "if this is the system under our State medical service; the parent has a right to know; this isn't Russia, you know." When the doubtless unconvincing excuse was put forward that parents are inclined to worry, his comment was: "It's a strange doctrine. We say we live in a democracy: I often wonder why." The matron, he said, had given four explanations of her reticence: (1) she did not realise how bad the child was; (2) she had no opportunity of telling the parents; (3) she thought they already knew; (4) she thought they would worry if they knew. Other outspoken observations by the court were aimed at medical witnesses. "I know dog doesn't eat dog," and "It is very difficult to get doctors to answer questions: they make very long rambling statements and, at the end of it all, they have not always applied their mind to the question asked them."

Two days after he made his award, the learned judge announced his reasons. It had been, he said, for the defendants to satisfy him that the injuries were not caused by the negligence of any one of the servants or agents for whom the management committee were responsible. This inversion of the usual burden of proof was presumably due to the doctrine *res ipsa loquitur*; the child went into hospital with a healthy left leg and came out a cripple; something must have gone wrong, and so the onus of proof was transferred to the hospital authorities. However that may be, the court held that neither defendant had discharged the burden; it was satisfied that there had been a high degree of negligence over a protracted period of time. The matron had not noticed (or had not heeded warnings of) the marked deterioration of the child's condition "practically from the moment the plaster was put on." Speculating on the mental approach of the matron and the medical officer, the judge thought the matron had been so confident of her skill, so certain she was right, that, when she found she had been wrong she shut her mind to the truth. Was the doctor "led into a sense of optimistic security by the over-optimism of the matron," or was he "really blind to the rapid deterioration of the child's condition"?

The court granted a stay of execution for twenty-eight days; an appeal is therefore possible. If the award of damages stands, the £5000 will presumably be paid in the end by the taxpayers. The hospital has no fund available for such a purpose; nor has the management committee the wherewithal to satisfy the claim; it will be passed on to the Sheffield Regional Hospital Board.

1. *Times* and *Manchester Guardian*, March 6, 9, 10, 11, and 13, 1954.

Parliament

The Problem of Air Pollution

IN the House of Commons on March 10, at the second reading of the City of London (Various Powers) Bill, Sir HERBERT WILLIAMS moved the omission of clause 4, which empowers the Corporation to prohibit the emission of smoke in the City. He explained that his purpose was to obtain a debate on air pollution, and though he did not regard the clause as satisfactory, he had no desire to press his motion to a division. Fifteen months ago peculiar atmospheric conditions had lasted in the Metropolitan area for five days, and as a result some 4000 people had died. He was satisfied that scientific knowledge at the moment was inadequate, and he urged an intensification of research to find the causes of the trouble. Many authorities held that sulphur dioxide was more harmful to health than particles of soot, ash, or grit, yet it was not filtered by any kind of mask. He believed that if we could reduce the sulphur dioxide in the atmosphere we could protect our health and our buildings.

Dr. BARNETT STROSS thought that we should start by cleaning up not one district but a wider area. The prevailing wind was such that the City would get little benefit unless Westminster, Fulham, Chelsea, and Kensington were also made smokeless areas. The Government should force local authorities to act more quickly. Sir ROBERT CARY pointed out that Manchester intended to extend its central smokeless area from 105 acres to some 500 acres. He asked the Government to give a 15% discount on coke to tempt people from the ordinary coal-burning grate.

Mr. WALTER ELLIOT said there were already Acts on the Statute Book to deal with this problem; what was needed was administrative action. Everyone should search his own heart and conscience about smoke pollution. If local authorities had not pressed in this direction it was largely because they had not been pressed by the public to do so. Mr. SOMERVILLE HASTINGS also believed that sulphur dioxide was the real danger and coke or smokeless fuel produced as much sulphur dioxide as did coal. Smokeless fuels might be useful, but we should not expect too much from them until more was known of the real cause of the trouble.

Mr. ERNEST MARPLES, parliamentary secretary to the Ministry of Housing and Local Government, said that the Government were determined to do all in their power to conquer air pollution. Thanks to the new oil refineries the Ministry of Fuel and Power now had larger quantities of smokeless fuel available. The Government meant to do what they could to persuade people and local authorities that it was essential for the smokeless zones that we should use smokeless fuel-saving appliances in our homes.

QUESTION TIME

Hospital Finance

Replying to Dr. R. F. B. BENNETT, Mr. IAIN MACLEOD, Minister of Health, said that the policy on projected hospital capital works which were to be financed from non-Exchequer funds had been reviewed. It was now no longer necessary for capital expenditure from non-Exchequer funds to count against capital allocations made to hospital boards. It would, of course, be necessary for him to scrutinise proposals to incur such expenditure by reference to any Exchequer maintenance expenditure that might be involved, the effect on the development of the hospital concerned, and the needs of the hospital service.*

Allocations to R.H.B.s

In answer to questions, Mr. MACLEOD gave the following figures for allocations to Birmingham Regional Hospital Board for maintenance and actual expenditure:

Year	*Allocation*	*Expenditure*
1950–51	£15,114,800	£15,025,903
1951–52	£16,940,050	£16,729,720
1952–53	£18,940,000 [1]	£18,377,963
1953–54	£19,691,000 [2]	

1. Included £205,761 for salary and wage awards which was not required.
2. Includes £136,893 for salary and wage awards which was not required by 31/12/53.

He also gave the following figures for Leeds R.H.B.:

Year	*Allocation*	*Expenditure*
1952–53	£14,588,000 [3]	£13,894,336
1953–54	£14,845,000 [4]	
1954–55	£15,022,000 [5]	

3. Included £222,869 for salary and wage awards which was not required.
4. Includes £128,170 for salary and wage awards which was not required by 31/12/53.
5. Includes £57,000 for salary and wage awards which may be announced between 1/1/54 and 31/3/55.

Replying to a question, Mr. MACLEOD said he expected that the money spent for capital purposes by regional hospital boards in the years 1952–53 and 1953–54 taken together would fall short of the amount so spent in the financial years 1950–51 and 1951–52 taken together by about £500,000. He was not aware that any board would have to close beds because of insufficient allocation of funds in the coming financial year, except that in one locality the Board was considering with the hospital management committee concerned the possibility of closing two units which were in any event not fully used.

Expenditure on Nursing Staffs

Replying to a question, Mr. MACLEOD said that he estimated the increased expenditure incurred by the regional hospital boards in 1952–53 for salaries of nurses at about £4½ million more than for 1951–52.

Doctors and Group Practices

Replying to a question, Mr. MACLEOD, said that some 60% of general practitioners taking part in the National Health Service now practised in partnerships, but he could not say how many partnerships would come within the definition of group practice given to him by the Central Health Services Council.

Domiciliary Visits

Dr. BARNETT STROSS asked the Minister whether he would permit full-time consultants to make domiciliary visits and receive payment on the same scale as now applied to part-time consultants.—Mr. MACLEOD replied: Under the arrangements agreed in 1949, additional payment may not be made for domiciliary consultations by whole-time officers. Any alteration of this provision would be a matter for the Medical Whitley Council.

Dr. STROSS: Is the Minister aware that the full-time men have no perquisites and no allowances, and that on average their income is somewhat less than the income not only of part-time men but of general practitioners nowadays? Will he not do something to see that their status is recognised? Mr. MACLEOD: I recognise the justice of a good deal, if not necessarily agreeing with all, of what the hon. member has said. He will realise that part of these complications arise out of an agreement negotiated in 1949, and part by the ordinary operation of the income-tax law in this country relating to whole-time appointments. It is precisely these kinds of matters that will come before the Whitley Council.

Mr. ANEURIN BEVAN: May I express the hope that the Minister will not solve the problem by converting all the full-time salaried staff to part-time, because that might be the consequence of my hon. friend's suggestion. Mr. MACLEOD: There are varied trends and different views in different regions of the country in relation to this matter.

Dr. STROSS: Is the Minister aware that I put this question down because many people recognise the excellent work done by these full-time men, but the last thing I want is to reduce the status of part-time people?—Mr. MACLEOD: I recognise that, but do not let us pretend that the standard of conduct or anything else is higher or lower among part-time men or full-time men. They are all members of the same profession.

Excessive Prescribing

Replying to a question, Miss PATRICIA HORNSBY-SMITH said that *prima facie* evidence of excessive prescribing by general practitioners was reported to the Minister in respect of 300 doctors in 1950–51, 263 in 1952, 320 in 1953. Of these, 852 were visited by his medical officers, and substantial reductions of cost resulted thereafter. The prescribing of 17 was referred in accordance with regulations to the local medical committee. So far in 9 cases sums ranging from £25 to £250 had been withheld from the doctors' remuneration. In 80% of the cases it was thought after investigation that there was no evidence of excessive prescribing; in the remaining 20%, 17 were referred out of 852 investigated, and in 9 of those action was taken, about 1%.

* See p. 618.

In England Now

A Running Commentary by Peripatetic Correspondents

OLD Mrs. Crudthorp lived with her son Mark in a small stone croft high up on the fells. For two years she had been bedridden. Buttressed by pillows, she sat rigidly in her bed, which had been brought down to the kitchen and fitted into a recess in the wall next the chimney-breast. Her arms, thin and brittle as winter sticks, lay on the worn coverlet. In her hands she held a small mirror, and by turning it carefully she could keep a vigilant eye on Mark without risking the pain of moving her head.

Mark was a mild, heavy, slow-thinking lad of 19. He was disfigured by a hare-lip and had a permanent redness round his eyes—like a person stung by his own private sandstorm. He looked after her with a clumsy devotion. She saw only his clumsiness and spent a large part of her day abusing him for it.

I visited her every month and I did not enjoy it.

"Your pills made me sick!" she said, when last I saw her. "The Americans can cure arthritis with ox bile. Why can't they do it here? Aren't there enough oxen? There are plenty of asses! When are you going to send up that young assistant of yours? He may have some fresh ideas!"

And then, as Mark followed me in from the yard, she fixed his image in the mirror and without the slightest deviation of her head said "Out with it. . . . What's gone wrong? You're hiding something."

"A gimmer lamb, Mother, down in the gulley."

"Fool! How often have I told you to fence the gulley? A shepherd? Your dog is better. Well, were you reared in a field? Get the doctor a chair."

I marvelled at the boy's forbearance and his acceptance of a life that seemed so onerous and so cruel—and so inescapable.

In the months of high summer, when her arthritis was easier, she occasionally relaxed her incivility, and one memorable morning she gave me a jar of jam made from the wild winberries that covered the hillside. But as a rule she was unspeakably rude and I would brace myself from the moment I left my house, and during the whole ten-mile drive over the moors, for a rough and squally interview.

Last month, when snow had made town visits difficult and country visits impossible, I found Mark waiting in my surgery. His coat was soaked and his eyebrows and the rough hair below his cap were congealed with snow. He was stricken with grief.

"She died on Tuesday night," he said; "she looks . . . so little . . ."

"Couldn't you get me?"

"No, the snow was packed high. I walked down . . . me and the dog."

I thought: "How can this man who has suffered so much from so harsh and ungrateful a woman mourn her so deeply"; and I cast about in my mind for something to say which might ease his pain. "You would not want her to live a crippled existence . . . and perhaps you will be freer now, and able to devote more time to the farm. I believe you wanted to rear some half-breds for the valley?"

His lips, dreadful in deformity, quivered, and in a voice clouded with despair he said "When I had finished my dinner, she always asked me if I'd had enough."

* * *

Since I last spent a spell in a hospital bed some articulate and unadaptable busybodies have bullied the matrons into organising a later start to the day. The joys of the early break-up of a white night were appreciated only by the really ill, but there was no real hardship even for those who were enjoying a good sleep, for they could always make it up later. But nowadays, at the end of a long fretful night the nurses rush madly about trying to telescope the work. My early tea gets mixed with the washing water, my bed is made while I am still brushing my hair, and the floor is swept during breakfast. All this is far from soothing. Night nurse said that if she had just one more hour, she could manage comfortably and give that extra bit to the patients which makes them feel cared for.

* * *

"O Happy band of pilgrims, look upward to the skies!" was the vicar's choice for the opening hymn last Sunday, and as our rough northern voices bellowed out the old familiar tune it occurred to me that there certainly had been rather a lot of torticollis cases in the surgery during the past month. By the time we reached the final amen the ætiology was clearly revealed. Our valley has lately been visited by a Flying Saucer. The initiative of my neighbouring colleague's son in photographing the Saucer has unnerved the local population, and even the Doubting Thomases glance anxiously upwards when they think that nobody is looking. The rest of us unashamedly revolve our heads like radar aerials.

In the taproom of the village pub experts have differed. The smarter know-alls wag their heads irritatingly and hint that our Saucer is something on Britain's secret list, and that we shall read all about it when someone smuggles in the next batch of American magazines. The pale-faced lad with the spectacles, sitting by the window, thinks that it is a flying cyclotron for manufacturing the new element no. 100 in the modern alchemist's elixir of uranium, curium, californium, and ekaholmium. We don't understand much about nuclear synthesis but we hope that no. 100 will be named *Conistonium*. Those of us with sons of our own are staunch Dan Dare fans, and make the bar ring with the jargon of space-ships and interplanetary travel. But the ancient greybeards in the ingle-nook voice our innermost feelings when they mutter about black magic. We really prefer to remain bedevilled about such Things, and it is unkind to undermine our faith in the supernatural. After all, our valley used to be a thoroughly happy little community, where we threw our witches over the bridge, wore potatoes next our skin, and enjoyed our native distaste for rationalisation. The little old woman in the pew in front still bows slightly when the name of the Devil is mentioned. As she says, you never know.

* * *

In America, that land of scientific eating, ultraviolet light is already used to boost the vitamin content of butter and margarine, and in many bars and cafés ultraviolet lamps help to sterilise cutlery and glassware when it is washed. What's more, a physicist friend assured me, some time ago that it is possible to cook by ultrasonic sound-waves. But if you want to be really up-to-the-minute, radioactivity's the thing. A team of scientists in Michigan has discovered that pork infested with *Trichinella spiralis*, enzootic in American porkers, need not be condemned as unfit for human consumption. Exposure for about one minute to radioactive cobalt or to fission waste products from an atomic pile renders it harmless. The radiations kill the larvæ in the meat, the flavour is not impaired, and the pork does not itself become radioactive. So we may soon look forward to a few irradiated rashers or some succulent slices of Harwell ham with the egg from our backyard hen.

* * *

I sometimes have had misgivings as to the value of the conducted tour of the health department made annually by groups of 14-year-old schoolboys, and this time I asked to see the essays written after this annual spree. Here are a few extracts:

". . . with chronic complaints like:—impetigo, ring-worm, and lousiness, the M.O.H. gives the various certificates after a long battle of words and reasons."

"Today hundreds of scientists are employed by the public-health services to test food suspected of containing germs."

"A surgeon, in the old days, seldom saw a wound healing without inflammation or superannuation."

"People who are suffering from infectious diseases go to insulation hospitals."

I can't say my misgivings have been entirely removed.

* * *

Patient (sitting on the edge of his chair and turning his hat round and round in his hands): Should I give up smoking, doctor?

Doctor (looking at the ashtray on his desk overflowing with cigarette ends): How much do you smoke?

Patient: Two cigarettes a week.

Doctor: Try three a week for luck.

Letters to the Editor

PELVIC TUBERCULOSIS IN WOMEN

SIR,—An investigation into the frequency with which pulmonary tuberculosis spread to the female genital organs was undertaken some three years ago. It was my intention to include as many women as possible with pulmonary tuberculosis between the ages of 15 and 45, and all others who might complain of pelvic symptoms. Because of the lack of volunteers, however, the series is largely composed of women complaining of some symptom referable to the pelvis or of women with a pyrexia not wholly explained by the chest condition.

Altogether, 100 women with pulmonary tuberculosis, patients in the same sanatorium, have been examined bimanually for evidence of adnexal swelling; each patient was also curretted and the currettings examined for evidence of tuberculosis. In 25 cases tissue-culture and guineapig inoculation of the currettings was performed as well, but these were consistently negative, so it was decided to carry out these investigations only if the pathologist was suspicious of the microscopic findings.

The first 25 cases were found to include 6 patients with pelvic tuberculosis: 3 of them had large tubo-ovarian abscesses and were eventually treated by panhysterectomy.[1] None of these 25 patients had had chemotherapy prior to the discovery of the pelvic extension. Since then a further 75 cases have been examined. No more cases of pelvic tuberculosis have been discovered. Because of the more widespread use of chemotherapy, it was not possible to examine any of these 75 women before they had received a course of one or more drugs.

During this period, 6 proven cases of pelvic tuberculosis were found among another series of 75 patients referred to me for various gynæcological reasons, mostly sterility. Of these 6, 4 gave a history of pleurisy or of definite pulmonary tuberculosis; the organism was the human bacillus in each case.

Only 1 other patient with pelvic tuberculosis was seen in this sanatorium in the same period. She had been discharged as cured of a pulmonary lesion, but some six months later she had a vaginal discharge, and was found to have bilateral tubo-ovarian abscesses and a vaginal fistula. She responded indifferently to a ten-week course of streptomycin, *p*-amino-salicylic acid, and isoniazid, but eventually she made a complete recovery after panhysterectomy. This patient had had no chemotherapy for her chest condition, which remained well healed.

This is a small series, but it does suggest that pelvic tuberculosis is common as a result of hæmatogenous spread from a pulmonary lesion; and that if chemotherapy is given early in pulmonary tuberculosis it will prevent this form of extrapulmonary spread in a large proportion of cases. This is especially important in young girls and women of childbearing age; these patients may have the pulmonary lesion cured, but the genital spread, which in practically every case means childlessness, may have more serious results than the original lesion.

Jameson[2] attributes to chemotherapy the fact that in Saranac Lake Sanatorium, New York, there has been no case of endometrial tuberculosis in the last five years; but he does not say how many patients were examined. I do not share his view that the best treatment in genital tuberculosis is radical removal in every case, but I do agree that it should be considered in all but the very early cases. The results of surgery combined with chemotherapy are uniformly good.

If these cases are discovered early enough, before the tubes are damaged, they can be cured by chemotherapy alone, and normal function can be restored.[3] A course of chemotherapy given to all young girls and women of childbearing age with primary tuberculosis would help to prevent genital spread; considering that 1 in 10 of all married women are involuntarily childless, and that at least 5% of these are sterile because of genital tuberculosis, the possible benefits are evident. The emphasis should be on prevention by early treatment of the primary lesion, for the chances of cure and the return of physiological function are not good, on the results published so far.

Galway, Eire. DIARMUID O'DRISCOLL.

1. O'Driscoll, D. T. *Lancet*, 1951, ii, 476.
2. Jameson, E. M. *Amer. J. Obstet. Gynec.* 1953, **66**, 1131.
3. Barns, T., Smith, H. G. M., Snaith, L. M. *Lancet*, 1953, i, 817.

FULL-TIME—PART-TIME

SIR,—Your readers will be grateful for your editorial last week, which so effectively summarises the existing discrepancies between the full-timer and the part-timer.

Unfortunately it looks as if nothing short of an amendment of the Income Tax Act of 1952 will provide a satisfactory solution. For an item to be allowed as an expense against schedule-E assessment it has to be incurred wholly, exclusively, and necessarily in the performance of the *duties* (para. 5, 9th schedule). This, in effect, means that the taxpayer must be compelled to make the payment under the conditions of his appointment. Not all employing authorities will accept the responsibility of itemising the varied expenses of their whole-time specialists, so that up and down the country there is no uniformity of action. A doctor assessed under schedule D, on the other hand, has only to prove that the payment was made wholly and exclusively for the purpose of his *profession* (section 137A) and this, of course, is very much easier to do. My information is that the near-whole-timer, because of the decrease in private practice, is finding it increasingly difficult to claim under schedule D and is in much the same position as the whole-timer. This as much as increasing cost, is why specialists with heavy commitments are having to cancel subscriptions to journals, thereby throwing extra weight on the libraries and reducing efficiency and the general level of medical culture.

Equally serious is the increasing inability of the whole-timer (and here I include the near-whole-timer) to attend national meetings, and especially international congresses, without help from his employing authority. If the basic cost of attendance at an international congress is £200, a doctor has the option of either having it paid in whole by his hospital, assuming they are willing, or of standing the amount himself: for the average consultant the cost of the congress will represent about £400 gross. Any desire on the part of the doctor to contribute towards the expenses is not acceptable to the Inland Revenue. It is apparently an impossibility to have such expenses as are incurred in attending a congress recognised by the employing authorities and an assessment made by them honoured by the Inland Revenue, although this would make for uniformity in the treatment of claims throughout the country.

It would be desirable, both for the economy of the service and the self-respect of the doctor, if the employing authority could contribute, say, £100 towards the cost of attendance at the congress, and the doctor the remaining £100, in the knowledge that this amount would be accepted as an expense. As it is at the moment, the service, because of shortage of money, cannot meet the legitimate needs of the doctors wishing to attend international congresses, and so one or more are selected by the regional boards for attendance. This selection must inevitably make invidious distinctions.

Undoubtedly the payment of a substantial betterment factor would help the whole-time and near-whole-time specialist, particularly the younger one, to be less restricted in his professional activities, but would not solve the fundamental and iniquitous distinction which is made by the

Income Tax Act of 1952 as it is usually interpreted. Other professions, admittedly not so seriously involved as ours, would also benefit.

Maida Vale Hospital,
London, W.9. W. H. McMENEMEY.

NURSING BY THE MOTHER

SIR,—"If many persons do many things for many patients cross-infection seems inevitable." [1]

Six days after Dr. and Mrs. Pickerill's article was published, the *Yorkshire Post* for March 5, under the heading "Food poisoning kills baby in hospital," printed a column the final sentence of which read:

"Recording the jury's verdict, the coroner remarked: 'Everyone seems to be satisfied, generally speaking, that all precautions which should be taken are being taken. At the same time the child caught this germ, and all the medical opinion I have heard seems to indicate that it was very possibly after it went into hospital, which seems to show it has come from some person's or persons' hands in that hospital.'"

The Pickerills in Australia and Sir James Spence in England have shown how ill children should be nursed in hospital. In most hospitals in England the child is treated like a "miniature adult." Sometimes a few partitions and the so-called "barrier nursing" are used as a sop to the consciousness of inadequacy. If the baby is nursed in a separate room by someone, preferably its own mother, who looks after no other baby, then and then only is there a chance of limiting cross-infection.

Some years ago two babies under my care died in tragic circumstances after an operation for hare-lip. Both babies died from gastro-enteritis which they had acquired after admission to a children's ward containing 35 cots. One developed this dreaded illness on the day after the stitches had been removed—in fact on the day it was due to go home. The other started on the day after it arrived home from hospital. Since then hare-lip babies have not been admitted to the general ward, but to small separate rooms, if possible with their mothers. Gastro-enteritis as a postoperative complication has not occurred since. This experience prompted me to state in 1949, when describing the treatment of hare-lip:

"Breast feeding should under nearly all circumstances be encouraged and continued up to the time of operation and afterwards. The mother should be admitted with her baby into a separate room in the hospital, whether the baby is 'on the breast' or not, because however the baby is fed, the mother is usually the best person to look after it. If this is impossible to arrange, because the mother cannot leave her home or other children, the baby should still be admitted to a small room away from direct or indirect contact with other babies and should never be admitted to a general infant's ward. For, if a hare-lip baby is treated in the ward, there is always a danger of gastro-enteritis in the post-operative period and tragedies will occur. These infections may be extremely virulent, and as we are so profoundly ignorant of their nature, no specific antidote is available. It seems, however, to be generally agreed that it is an infection which is usually contracted in a hospital ward and is carried directly or indirectly from another infant. Breast-feeding ensures a valuable immunity, and the danger of cross-infection can be avoided if the baby is isolated in a separate room without any contact with other babies or with nurses who look after them." [2]

Surely it is time that the administrators of the health service realised that it was more important to save babies' lives than to provide elaborate furniture in outpatient departments and offices. At present, through their failure to provide adequate facilities for the treatment of babies in hospital and to provide burns centres to prevent cross-infection, especially among burned children, tragedies are occurring which could be prevented. When a burned child's wounds are dressed in a general surgical ward, cross-infection is inevitable. The result is unnecessary mortality, mutilation, and pain.

Leeds. MICHAEL C. OLDFIELD.

1. Pickerill, C. M., Pickerill, H. P. *Lancet*, Feb. 27, 1954, p. 425.
2. Oldfield, M. C. *Brit. J. Surg.* 1949, **37**, 178.

REGISTRABLE QUALIFICATIONS

SIR,—During the past week practitioners in Great Britain have received a circular from the General Medical Council requesting certain information regarding their medical qualifications so that the *Medical Register* may be kept up to date. This circular brings to light certain anomalies regarding "additional qualifications which are registrable under the Medical Acts"—i.e., that "only certain kinds of additional qualifications are registrable such as M.B., CH.B., M.D., CH.M., M.R.C.P., F.R.C.P., F.R.C.S., and D.P.H." The letter goes on to say that qualifications which are not registrable include B.A.O., D.R.C.O.G., M.R.C.O.G., D.A., F.F.A.R.C.S., F.F.R., D.C.H., D.L.O., D.O.M.S., D.M.R.D., D.M.R.E., D.P.M., D.T.M., and D.T.H.

Presumably the "registrable qualifications" only include those in existence at the time the Medical Acts were passed by Parliament (1858–1886). Surely it is now time that these Acts were amended to include important qualifications since established. If M.R.C.P., F.R.C.P., and F.R.C.S. are registrable, why not M.R.C.O.G. and F.R.C.O.G.: if D.P.H., why not D.P.M., F.F.R., F.F.A. R.C.S. and the rest of the specialist diplomas?

King's College Hospital,
London, S.E.5. A. H. GALLEY.

INSULIN-ZINC SUSPENSIONS

SIR,—The careful study of the insulin-zinc suspensions by Dr. Venning (March 6) raises several points of interest. He reports that many of his patients required a larger dose of I.Z.S. than of the insulin they had previously taken. "In certain instances the increased dose merely reflects an improvement in treatment" he says, and this is in accord with my own experience. It is true that there have been few instances where a smaller dose of the new preparation has been required, but I would point out that in 11 of the cases reported by Dr. Wilson and myself,[1] and in 7 of Dr. Oakley's series,[2] better control was obtained with I.Z.S. than with the previous insulin *in the same dosage*. As Dr. Fitzgerald and his colleagues [3] have observed, certain patients, when transferred to I.Z.S. in the same dosage, show serious deterioration in control, and Dr. Venning wisely emphasises the necessity for careful supervision and adjustment of dosage when change is made to I.Z.S. This change, however, can usually be made without difficulty, and I have found in several cases that control, often better than that obtained previously, can eventually be secured with the dose reduced to its previous level.

With regard to the adequacy of the 3:7 mixture of amorphous and crystalline insulin in lente insulin, Dr. Venning confirms previous reports that this is satisfactory in the majority of cases; and this is very convenient for these patients, who avoid the necessity of themselves making a mixture. Undoubtedly certain patients require other proportions. In the series which I reported [4] the amount of amorphous insulin required varied from 0–57% in 21% of cases. Accordingly, while Dr. Venning is correct in implying from our original paper that we did not advocate the general use of semilente (we had in mind its use per se), this preparation and ultralente are required for the adjustments to lente for some of these patients.

Dr. Venning is not quite correct in stating that there have been no previous reports of local reactions to

1. Murray, I., Wilson, R. B. *Brit. med. J.* 1953, i, 242.
2. Oakley, W. *Ibid*, p. 1021.
3. Fitzgerald, M. G., Thorn, P. A., Malins, J. M. *Lancet*, Jan. 23, 1954, p. 187.
4. Murray, I. *Brit. med. J.* 1953, ii, 1377.

insulin-zinc suspensions. These were noted by Stuart Mason and Verel [5]; and I recorded [4] troublesome local reactions in 2 patients recently diabetic and treated from the start with lente insulin. In the course of a few weeks, however, these subsided. In a few patients who had previously had trouble at the site of injection of mixtures containing protamine zinc insulin, I have seen slight local reactions with lente, but these have always been less severe. In our original series, several of the patients were selected for trial because of manifestation of local allergy, and the relief they obtained with the new preparation was quite striking. In fact, so convinced am I of the advantages of the lente preparations that since their introduction to general use I have not used protamine zinc insulin in any new diabetic. On the other hand one hesitates to change a patient already well controlled with a single daily dose of soluble insulin and P.Z.I., and so we must have the latter on the market for a considerable time to come.

Glasgow, C.3. IAN MURRAY.

SMOKELESS FUELS

SIR,—The case of the ordinary householder against coke and the manufactured smokeless fuels is that, owing to carelessness of coal merchants, they contain so much water, having been exposed to rain. The purchaser buys water and not oxidisable material—and pays through the nose for it.

Donhead St. Mary, Shaftesbury, Dorset. V. H. MOTTRAM.

POLYMYXIN B

SIR,—In their article of Dec. 19 Dr. McGill and Dr. Mendel describe an intrathecal reaction to polymyxin B. It seems that the patient received 300,000 units of polymyxin intrathecally in twenty-four hours, having been given three doses of 100,000 units twelve-hourly. The dilution of the polymyxin is not stated. This dose seems rather greater than that given by other workers, and may perhaps account for the reaction, as Dr. Jawetz (March 6) has pointed out.

Two patients in the university department of neurosurgery, Manchester Royal Infirmary, under Mr. R. T. Johnson, were successfully treated with intrathecal polymyxin B.

The first was a man of forty who had recurrent meningitis after the complete removal of a cerebellar hæmangioblastoma. The meningitis was suppressed, but not cured, with aureomycin. In the fifth attack of meningitis an atypical coliform was cultured from the cerebrospinal fluid. After the seventh attack, polymyxin B was given in a single daily intrathecal injection varying from 20,000 to 64,000 units (usually 40,000 units) in 5 to 8 ml. for twenty-four days. He got pins-and-needles in his legs several times, lasting up to thirty seconds, and once had pain in the sacrum and down the back of the thighs, with straight leg raising limited to 45°, lasting several hours (after only 20,000 units). He made a good recovery.

A boy of eight had an infected postoperative C.S.F. loculus in the occipital region after the complete removal of a cerebellar astrocytoma. No organisms could be cultured from it, but the clinical signs of meningitis settled after 24,000 units of polymyxin B daily into the loculus for twelve days. There were no untoward effects; up to 100,000 units were given on one occasion without harm, but the polymyxin was well diluted in the loculus.

Reactions to intrathecal polymyxin have been described.

10 mg. (100,000 units) intrathecally in dogs gave transient paresis of the hind legs.[6]

Severe pain in the legs and pain once at the site of injection occurred in a man of 35 with pseudomonas meningitis who was given 5 mg. (50,000 units) polymyxin B diluted in 8 ml. saline intrathecally. Treatment was stopped because of this after the third dose. Intramuscular treatment was given for sixteen days. The fluid was sterile after the second day and the man recovered.[7]

In a girl of seventeen a third course of 2 mg. (20,000 units) intrathecally twice daily had to be stopped after four days because of pain in the back. She recovered after intramuscular treatment for sixteen days.[8]

The maximum safe intrathecal dose of polymyxin is possibly of a similar order to that of penicillin—perhaps 50,000 units per day, though 20,000 units is probably adequate.

On the other hand, intramuscular polymyxin B has been shown many times to be toxic and not once to be of any value in the treatment of meningitis. Schoenbach was unable to detect polymyxin in the C.S.F. after intramuscular injection, even in the presence of purulent meningitis.[9]

York. J. G. BANCROFT.

THE HOSPITAL MAKES FRIENDS

SIR,—The Portsmouth Group Hospital Management Committee are to be heartily congratulated on studying the individuality of both patients and staff, especially in these days when suitable staff is difficult to recruit. So much of what you say in your leading article of March 6 should be taken to heart by all hospital management committees.

For some time past I have been disgusted by the lack of coöperation between the hospitals and the referring doctor. Seldom do I get a report—admission, interim, or discharge—in spite of the fact that I have often sent long and comprehensive reports about the patients. There was a time when hospitals did furnish reports, and private institutions still do so. On those rare occasions when I have asked for a report there has been a considerable interval between the discharge of the patient and the receipt of the report, which has seldom contained any useful information. Not so long ago I received a report which was definitely misleading.

Bishop's Stortford, Hertfordshire. D. N. HARDCASTLE.

LANGUAGE OF THE HEART

SIR,—Of an English literature without Greece or Rome one could only predicate one thing with certainty—that it would be vastly inferior to what we have today. Even the Beowulf is known to be far below Homer. Chaucer, our earliest writer of the first rank, owes almost nothing to the English invaders of our land, almost everything to Mediterranean culture; and when the great age of English began with Shakespeare and the Elizabethans, it was from the Renaissance that inspiration came. Indeed our very language owes its wonderful strength and flexibility to the fact that it is an alloy, part native English, part classical adoption. Men of science, because more than anyone they are in the habit of borrowing from Greek and Latin, should surely pay particular honour to these two languages, remembering also that without them they might still be living in the Middle Ages. Yet Dr. Gardberg, in his letter of Feb. 27, sees no objection to coupling together Greek and Latin words, as has been done in the term "valvotomy." I cannot agree with him there. Such a practice is not in accordance with the best usage, Greek, Latin, or English, and the correct name for it is "barbarism." Perspicuousness is not the only virtue of good language; appropriateness and distinction are necessary as well. (Zeno Stoicus apud D.L. VII. 59.)

To my mind, a crisis has come upon medicine in this country now, though few seem to be aware of it. Shall medicine retain its status as a learned profession or shall it forfeit the proud title it still holds? If the former is to be, there is need to reform our pronunciation and to

5. Mason, A. S., Verel, D. *Ibid*, p. 1215.
6. Schoenbach, E. B., Bryer, M. S., Bliss, E. A., Long, P. H. *J. Amer. med. Ass.* 1948, **136**, 1096.
7. *Arch. intern. Med.* 1951, **87**, 6.
8. Hayes, E. R., Yaw, E. *Amer. J. med. Sci.* 1950, **220**, 663.
9. *J. Mt Sinai Hosp.* 1950, **16**, 71.

be much more careful over our vocabulary. If the latter, we shall be back with Keats, "Back to the shop, Mr. John, back to pills plasters, ointment boxes, etc." We shall be not physicians, simply technicians.

Orpington, Kent. H. ST. H. VERTUE.

MEDICAL WRITING

SIR,—I wonder if I detect the tongue in cheek of your Peripatetic Correspondent of Sept. 19, 1953, who suggests "a College, preferably Royal, of Medical Scribes. . . ." By many of your readers such a college undoubtedly will be considered a *reductio ad absurdum*; but sober thought may lead to the conclusion that the idea is not without merit. Indeed, the editor of the *New England Journal of Medicine*, in his issue of Dec. 10, calls it "a pertinent suggestion."

We in the United States, where "they need it even more," have an association, now in its fourteenth year, which is devoted to the improvement of the written word of medicine. It is rapidly gaining influence, and, although it does not boast the august stature of a college, it seems to be firmly established.

The problem of improving medical writing is somewhat overwhelming. The most promising point of attack probably lies in the inclusion of specialised instruction in the already crowded medical curriculum. As an alternative suggestion, the techniques of writing might be required of students during the so-called pre-medical years of college preparation. Certainly, neither of these suggestions will improve the writing of present-day authors, but they would assure a new generation of physicians, properly trained in these techniques.

Thus far, we have no progress to report on the requirement of sound writing of medical or pre-medical students. We can report, however, that formal courses in medical journalism are to be offered for the first time next September at two of our well-known State universities—the Universities of Illinois and Missouri. It is not expected that graduates of these courses will enter on the formal study of medicine, but rather that they will become available as editorial assistants for employment by medical journals, medical book publishers, and large clinics and hospitals. We consider this progress to be a long step in the right direction.

So, college or no, your American confreres are aware of the need for better medical writing on this side of the Atlantic. We have set ourselves to a Herculean task, perhaps akin to that recounted in the tale of the Augean stable. We have made a start, although the greater part of our labour lies before us.

LEE D. VAN ANTWERP
President-elect,
The American Medical Writers' Association.

ALPHA-TOCOPHEROL IN THE PROPHYLAXIS OF THROMBO-EMBOLISM

SIR,—In their interesting article of March 6 Mr. Wilson and Mr. Parry seem to be unaware that we were the first to describe the use of alpha-tocopherol in the treatment and prophylaxis of thrombo-emoblism.[1] This observation has since been confirmed by many groups of workers, most of whom have already been mentioned in your columns.[2]

It was some three years after our first publication that the Ochsner group published their modification of our treatment, using intravenous calcium in addition to alpha-tocopherol. We have strenuously disagreed with the need for this modification. Indeed, Ochsner himself published the details of cases successfully treated with alpha-tocopherol alone. Wilson and Parry were not the first to find the tocopherol and calcium combination difficult to use,[3] and others besides them have found that patients receiving alpha-tocopherol alone did better than those treated with a combination of tocopherol and calcium.[4]

Wilson and Parry would have improved their results almost beyond recognition by using larger doses of alpha-tocopherol. We ourselves always give such patients 300–600 I.U. per day, and Ochsner, it will be remembered, advocated 600 I.U. per day. One-half to one-third of the proper dose is not enough. Some patients find it a little difficult to tolerate such dosage of a synthetic preparation, and for that reason we have largely confined ourselves of recent years to natural alpha-tocopherol.

Shute Institute,
London, Ontario,
Canada.

WILFRID E. SHUTE
EVAN V. SHUTE.

1. *Trans. Kansas City Acad. Med.* 1946, 1947, 1948.
2. Shute, W. E. *Lancet*, 1952, i, 108.
3. Crump, W. E., Heiskell, E. F. *Texas St. J. Med.* 1952, **48**, 11.
4. Moorman, R. H., Snyder, H. E., Snyder, C. D., Grosjean, W. A. *Arch. Surg.* 1953, **67**, 137.

THE DUMPING SYNDROME

SIR,—Mr. Schofield (March 6) is quite right to draw attention to the importance of the afferent-loop syndrome and to the value of the Roux en-Y anastomosis, which Mr. Hall discusses in an accompanying letter. I do not, however, believe that all the postprandial symptoms can be attributed to this cause, and perhaps this point of view may be illustrated by two examples:

1. Patient E whose electrocardiograms (E.C.G s) are shown in fig. 2 of my article (Feb. 13) experienced severe vasomotor symptoms after a radical Billroth-1 resection.

2. Another patient, after a Polya resection, suffered from the afferent-loop syndrome with only relatively mild vasomotor symptoms. He derived great benefit from en-Y anastomosis, gaining 3 st. in weight, and being able to return to full work. He was so pleased that he told us that he no longer had any symptoms. When he attended for an E.C.G. (for comparison with one taken before the anastomosis) he confessed that if he ate a good meal he still experienced fullness, nausea, drowsiness, and occasionally palpitations. A meal of minced meat 120 g., toast 45 g., and jelly containing 100 g. glucose was used; on this occasion the jelly was withheld for 25 minutes after the meat and toast. He had no symptoms, and showed no increase in heart-rate, rise in blood-sugar, or E.C.G. changes until eating the jelly; but 3 minutes after this he had fullness, nausea, facial perspiration, and, in 10–15 minutes, drowsiness and palpitations. The heart-rate rose from 67 to 91 in 14 minutes, the blood-sugar from 46 to 205 mg. per 100 ml. in 21 minutes, and the usual E.C.G. changes were seen.

With regard to Mr. Schofield's second point—I think he has read rather more into this than was actually written. I suggested that the extent of resection is of some significance in the production of symptoms. I do not believe that patient E would have experienced such severe symptoms if the resection had been limited. On the other hand, patients not exhibiting this peculiar reaction to sugar have had equally large resections without any symptoms.

County Hospital, York. C. N. PULVERTAFT.

SIR,—I should like to congratulate Mr. Schofield on his series of Roux en-Y gastrectomies, the results of which are amply confirmed from our own cases.

Because of our experience of absence of bilious vomiting after total gastrectomy for cancer, using the Roux loop for œsophagojejunal anastomosis, we decided $3^1/_2$ years ago to modify previously done partial gastrectomies which were unsatisfactory because of bilious vomiting and the associated post-gastrectomy syndrome. Some 20 such cases have now been revised in this way, and, with the exception of 2 where the old afferent loop was joined to the jejunum too near the stomach, there has been complete relief of this part of the syndrome—i.e., no bilious vomiting or nausea, considerable gain in weight and strength, and in some cases relief of heartburn

where this was previously present. As evidence of our satisfaction, the modification is now incorporated as a primary procedure in all but emergency gastrectomies.

I would, however, agree with Dr. Pulvertaft in questioning the view that it has eliminated *all* forms of the post-gastrectomy syndrome. Vasomotor symptoms—faintness, dizziness, palpitations, sweating, or weakness in the limbs soon after food—while sometimes improved by the modification still occur in all those patients who had such symptoms previously. In our opinion vasomotor symptoms depend on a different physiological mechanism from that responsible for bilious vomiting.

Before Mr. Schofield's article appeared we believed that we were working alone on the Y anastomosis; so we proceeded with considerable caution and even now would temper enthusiasm for the method in case it should become a new source of recurrent ulcers. We have not yet had experience of this outcome, probably because we employ the high gastrectomy which Mr. Schofield advocates with the Roux loop.

County Hospital, York. R. A. HALL.

PAINLESS APPENDIX ABSCESS?

SIR,—"Sir Daniel Whiddon" described last week (p. 566) a case of ruptured appendix abscess, in which the patient had no pain until the abscess burst. Has he in fact met an appendix abscess which developed with no abdominal pain whatsoever until it ruptured? If so, what is the cause of this painless acute abdomen?

London, E.2. G. G. LAWSON.

PATHOLOGISTS AND PNEUMOCONIOSIS

SIR,—Dr. Triger (March 13, p. 574) regrets that we cannot at present "make an intra-vitam diagnosis of pneumoconiosis with anything approaching practical certainty" and writes of post-mortem "confirmation." In life the diagnosis is based primarily on the chest radiograph. In respect of X-ray diagnosis, a logical and widely accepted system of quantitative classification has been evolved.[1 2] The great errors encountered in its use have been explored and means of reducing them proposed[3]: the relation of this classification to the natural history of the disease, prognosis, disability, and dust exposure has been demonstrated.[1]

In contrast, no generally agreed system of pathological classification has been devised. No studies have been published on errors in diagnosis or on the quantitative relation between pathological changes and preceding disability. There is no doubt that pathologists differ widely in their diagnoses. Within the last year, ordinary dust deposits in the lungs of town-dwellers have been described by one pathologist as "pneumoconiosis,"[6] but I have been told by another pathologist that he would only make the diagnosis when he found palpable collagenous nodules in the lung. There are occasions when the nature of a shadow, wrongly interpreted by a radiologist, can be diagnosed with certainty by the pathologist, and a normal chest film may conceal gross focal emphysema due to pneumoconiosis, but these are very rare occurrences.

The "true incidence of pneumoconiosis," to which Dr. Triger refers, could only be discovered by examining a random sample of the population under consideration. Chiefly owing to sampling errors, certification figures may be grossly misleading.[7] Figures from post-mortem examinations would be still more misleading, for the sampling error would be even greater, and to this would be added the uncharted errors of the pathologists.

Dr. Triger's letter is an example of the unwarranted self-confidence by which clinicians, radiologists, and pathologists may all be affected when they ignore the problem of observer error, to which you recently drew attention.[8] It is remarkable how appropriate to this attitude is the parable of the beam and the mote.

Postgraduate Medical School of London, London, W.12. C. M. FLETCHER.

ACQUIRED TOXOPLASMOSIS

SIR,—Your issue of Feb. 6 has just reached me and I have read the description by Dr. Skipper and his colleagues of two cases of acquired toxoplasmosis, and your comments on this disease. Your readers may be interested in a case which I have seen here in Sierra Leone.

The patient is a Lebanese man, now aged 21, who was born and has lived nearly all his life in this country. For several years he has kept many animals as pets (apes, monkeys, wild cats, birds, &c.) and has attended to them himself. In 1949, a favourite chimpanzee died after a long illness which ended in paralysis and coma. A few months later he himself had what was thought to be a severe attack of malaria. This was before I saw him but, according to his description, the illness lasted more than two months, with intermittent high fever, headaches, and delirium at times; and he remembers particularly frequent vomiting, anorexia, and great lassitude. He was given antimalarial drugs but recovery was slow, and as the fever abated he first noticed his eyes becoming dim. In 1950, he went to Dakar for treatment for his eyes, but his vision continued to deteriorate, so he eventually went to England. He visited Moorfields Eye Hospital on July 9, 1951, where he was seen by Mr. J. D. Magor Cardell.

Mr. Cardell has kindly given me permission to quote from his findings: "Both maculæ showed choroidoretinal degenerative areas which were considered to be due to toxoplasmosis. Complement-fixation test for this condition was returned as positive, with the note by Dr. Norman Ashton that this 'result is the highest positive which we have had in adults, and it is thought that the infection might be recent.'"

The diagnosis was thus confirmed, and the history of the illness in 1950 supports Dr. Ashton's suggestion. In view of the known frequency of toxoplasmosis in animals, it may be that this is an example of a human infection acquired directly from an ape.

Methodist Mission Hospital, Segbwema, Sierra Leone, West Africa. J. R. ROSE.

PROLONGED APNŒA FOLLOWING SUXAMETHONIUM

SIR,—There have been so many letters on this subject that I hesitate to add another. But having given suxamethonium on 1221 occasions without inducing prolonged apnœa, I have been stimulated by Dr. Frank (Dec. 26) and Dr. Walker (Jan. 9) to describe a case which I saw some three months ago, and which, I think, proves beyond doubt that thiopentone is quite often, and certainly in this case, responsible for the prolonged apnœa often attributed to suxamethonium.

A healthy Indian woman of 26 years was brought to the operating-theatre for tonsillectomy. She was anæsthetised by a very experienced senior resident anæsthetist, who induced her with 0·6 g. of thiopentone followed by 50 mg. of suxamethonium. A nasal tube was passed, and anæsthesia was maintained with nitrous oxide, oxygen, and small amounts of trichlorethylene.

Complete apnœa lasted for 65 minutes, the trichlorethylene being turned off after 20 minutes when the operation was completed. Adequate respiration returned 75 minutes after induction, and the patient was then taken back to the ward.

Five days later I was fortunate enough to have the patient's consent for an examination of her throat under general anæsthesia. I induced the patient with nitrous oxide, and then gave ether and oxygen. Three minutes after induction I injected 100 mg. of suxamethonium—double the previous

1. Proceedings of the 7th Saranac Symposium, 1953. In the press.
2. Cochrane, A. L., Davies, I., Fletcher, C. M. *Brit. J. industr. Med.* 1951, **8**, 244.
3. Fletcher, C. M., Oldham, P. D. *Ibid*, 1949, **6**, 168.
4. Fletcher, C. M., Oldham, P. D. *Ibid*, 1950, **8**, 138.
5. Gough, J. *Occup. Med.* 1947, **4**, 86.
6. Gross, P., Brown, J. M. U. *Amer. J. clin. Path.* 1952, **22**, 821.
7. Cochrane, A. L. Application of Scientific Methods to Industrial and Service Medicine. H.M. Stationery Office. 1951.

8. *Lancet*, Jan. 9, 1954, p. 87.

dose. Normal spontaneous respiration occurred after 7 minutes, and she was returned to the ward conscious, 10 minutes after the induction.

Premedication for the first anæsthetic was 'Omnopon' gr. $^1/_3$ and scopolamine gr. $^1/_{150}$; and for the second, atropine gr. $^1/_{100}$ only, which may also have had some effect on the duration of the apnœa.

Department of Anæsthesia,
Grey's Hospital,
Pietermaritzburg, Natal,
South Africa.

J. D. M. BARTON.

DISMISSAL OF SENIOR REGISTRARS

SIR,—The Registrars' Group is anxious to know how many senior registrars have completed, or are likely to complete within the next six months, their four-year appointments as senior registrar, and who now find themselves in danger of having to change from their chosen career to some other field of work.

In May, 1953, transitional posts were authorised by the Ministry of Health, which permitted the creation of extra senior registrar appointments outside the regional establishment. It has been suggested that some regional boards have not taken full advantage of this scheme. These posts were designed for senior registrars who had completed four years' training and could be held for a maximum of two years, thus giving such senior registrars further time in which to obtain consultant or specialist appointments.

I should be grateful if any senior registrar so affected would write to me personally giving full details of his case, particularly where his post has been abolished or changed in character and no transitional post created in its place.

PHILIP L. ROBINSON
Chairman,
Registrars' Group.

Clatterbridge Hospital,
Bebington, Cheshire.

ION-EXCHANGE RESIN IN PREMENSTRUAL SYNDROME

SIR,—The premenstrual syndrome is characterised by tension in the breasts, lumbar and low abdominal pain, thirst, headache, nervous irritability, and even, rarely, epileptiform seizures. The main hypotheses regarding the pathogenesis of this very common syndrome can be classified as follows:

1. Hormonal imbalance:
   - (*a*) excessive or deficient formation of œstrogens and progesterone;
   - (*b*) disturbance in the elimination of œstrogens caused by hepatic dysfunction and abnormally high renal threshold for excretion of œstrogens;
   - (*c*) alteration in the adrenal function according to the adaptation theory of Selye;
   - (*d*) increased formation and decreased elimination of vasopressin.
2. Allergic disorder.
3. Changes in cholesterol metabolism.
4. Dysfunction of the autonomic nervous system.
5. Disturbance in water and electrolyte metabolism.

Apparently no one of these hypotheses can alone explain the syndrome. Of 60 cases treated by us with progesterone, 40 were benefited.[1] The common occurrence of œdema in the 20 cases in which progesterone failed drew our attention to the abnormalities in water and electrolyte metabolism. Their significance has already been emphasised by others.[2–8] In some of the refractory cases we gave during the premenstrual phase a low-salt diet, mercurial diuretics, thyroid extract, and ammonium chloride; but so far none of these remedies has proved entirely effective.

In the following case the combined ammonium and potassium polystyrene sulphonate, 'Katonium' (Winthrop), gave a satisfactory result:

The patient, aged 34, had been married 5 years. The premenstrual syndrome developed after her first delivery in 1949. She had excruciating headache resembling migraine, pain in the breasts, toothache, nervous irritability, and œdema of the ankles. Her symptoms became worse after a spontaneous abortion (1950) and after two normal deliveries (1951, 1952), and her weight continuously increased. Towards the end of her last pregnancy there was slight toxæmia. She had an operation for gall-stones in 1950. On admission the patient said that her body began to swell 10–12 days before menstruation; she had to wear a bigger skirt and shoes, and her rings would not go on her swollen fingers. The menstrual periods were regular, painless, and not copious.

The patient was obese and œdematous; her weight was 105 kg. and her height only 164 cm. No abnormalities were found in blood-pressure, fundi, chest, blood, or urine. During three premenstrual periods she was treated, while up and about, by a low-salt diet, progesterone, ergotamine preparations, thyroid extract, and ammonium chloride; but this did not affect her condition.

Administration of katonium was started on the 4th day after admission to hospital. During the previous 3 days she had lost 1 lb. in weight, evidently owing to rest in bed. Her basal metabolic rate was +16%, cholesterol 170 mg., and protein-bound iodine 5·48 mg. per 100 ml. Repeated examinations of the fluid and electrolyte balance revealed the following values: hæmatocrit 38%, non-protein nitrogen 25 mg. per 100 ml., alkali reserve 66·1 vol. per cent., serum-protein 6·8–7·0 mg. per 100 ml. The chloride level of the whole blood was 485 mg. per 100 ml. and that of the plasma 585 mg. per 100 ml.; blood-calcium 11·1 mg. and plasma-potassium 19 mg. per 100 ml. The Wassermann reaction was negative. Urinary hormonal analysis gave the following results: chorion gonadotrophin 65 mouse units per litre, œstrogens 200 mouse units per 24 hours, 17-ketosteroids 8·5 mg. per 24 hours. All these results fell within normal limits.

A radiograph of the chest was normal; there was slight frontal and parietal internal osteitis of the skull. The electroencephalographic diagnosis was dysrhythmia cerebri diffusa et paroxysmalis levis. Blood-pressure varied between 140/90 and 130/80 mm. Hg. The erythrocyte-sedimentation rate was 10–12 mm. in the first hour (Westergren), and the blood picture was normal.

9 days before the menstrual flow œdema of hands and feet developed, along with incapacitating headache. Both vanished when treatment was started with katonium 15 g. three times a day, and a diet low in salt but not deficient in calories. Administration of katonium was continued for 2 weeks, even during menstruation, and the patient lost 9 kg. in weight. The volume of urine varied between 1000 and 2200 ml. per 24 hours. During this treatment the patient, for the first time in 4 years, did not have any premenstrual symptoms.

When the patient was discharged from hospital and katonium was discontinued, the usual severe œdema and headache reappeared in the latter part of the next menstrual cycle. The daily gain in weight was about 1 lb. Administration of mercurial diuretics increased the urinary flow and lowered the body-weight as effectively as katonium. The headache also disappeared.

In this case the main pathogenic factor was apparently water-retention, since only katonium and mercurial diuretics rendered the patient free of symptoms.

One case warrants no generalisations, but the satisfactory result justifies further clinical trials of cation-exchange resins in this syndrome. The administration of resins can be restricted to the premenstrual period, and thus the potential complications of their long-term use are easily avoided. The absolute contra-indications to this type of therapy—e.g., grave renal disease—must of course be taken into account. Until more experience has been gained of cation-exchange resins the patient should be admitted to hospital for treatment.

Women's Clinic,
University of Helsinki,
Finland.

MATTI MUSTAKALLIO
OLAVI KINNUNEN.

1. Kinnunen, O., Mustakallio, M. *Duodecim*, 1952, **68**, 282.
2. Bickers, W. *Amer. J. Obstet. Gynec.* 1952, **64**, 587.
3. Campbell, D. A., Hay, K. M., Tonks, E. M. *Brit. med. J.* 1951, ii, 1424.
4. Fekete, A. *Zbl. Gynäk.* 1949, **71**, 972.
5. Greene, R., Dalton, K. *Brit. med. J.* 1953, i, 1007.
6. Greenhill, J., Freed, S. J. *J. Amer. med. Ass.* 1941, **117**, 504.
7. Morton, J. H., Additon, H., Addison, R. G., Hunt, L., Sullivan, J. J. *Amer. J. Obstet. Gynec.* 1953, **65**, 1182.
8. Rees, L. *Brit. med. J.* 1953, i, 1014.

LUNG CANCER IN NON-SMOKERS

SIR,—Most of us now seem to accept the suggestion that there is an as yet undisclosed carcinogen in tobacco-smoke. Yet for some reason it is assumed, without any proof, to my knowledge, that this agent is adsorbed by the respiratory passages of the smoker, so that it is no longer present in the exhaled smoke. Otherwise how can it be assumed by Doll,[1] for example, that all cancer of the lung in non-smokers is due to causes other than tobacco-smoke?

Tobacco-smoke is present to a greater or less extent in our places of work and amusement, transport vehicles, homes, and the village pubs and women's institutes. Without doubt there are other factors in the pathogenesis of lung cancer, for not even 100% of the heaviest smokers get this disease. This personal susceptibility is important and maybe, when exposure is slight, as in non-smokers, the small proportion of the latter that suffer do so because of their excessive susceptibility.

I do not envy the statisticians if they try to prove or disprove this suggestion; the difficulties are enormous, but the proposition, if there should be any substance in it, opens important moral and hygienic questions. To what extent can smokers endanger the lives of others, and what can be done by means of ventilation to lessen the risk?

I. GORDON
Ilford. Medical Officer of Health.

MUNCHAUSEN'S SYNDROME[2]

SIR,—In a little county-town hospital of less than 150 beds the intake problems are fairly acute; no sooner is a bed empty than it is quickly filled—but not always by the right kind of patient.

He appeared in the casualty department in an apparently dazed condition; it was said that he had fallen backwards off a bus and that he had been brought in by a stranger who had then disappeared. He had, he thought, been unconscious for a short time and had vomited twice on his journey to the hospital. He seemed a quiet, reasonable individual but gave a name and address which he admitted three days later to be false. At the time of his admission he appeared pale and shocked. X-ray examination of the skull showed a possible oblique fracture of the occipital bone, involving the posterior fossa.

He complained of severe headache and diplopia and showed signs of cranial irritation and photophobia. Examination revealed nothing abnormal except that the diplopia was unilateral. Several ophthalmoscopes were used, many fingers were wriggled, and the books were studied for possible causes of uniocular diplopia. The ward-sister, on the other hand, was suspicious of the patient, from the start, and more so when, after three days, no visitors had come to see him. A porter was sent round to the local address he had given, but he found that there was no-one of that name living there. The patient then said that he was a male nurse (this was found to be true) and that he had a brother in a nearby town. The police there were asked to contact the brother and agreed to do so, adding, however, that they did not think that he would come—"he hardly ever did so." This remark led the house-surgeon to inquire further, and he found that the police had had seventeen similar calls for the brother in the past three years, usually because of concussion or a suspected fractured skull. These calls had come from hospitals in London and the home counties, including most of the London teaching hospitals. Four or five of these, hospitals, the latest in the list, were contacted and it was found that the story was almost identical in every case—the backward fall from the bus, the unconsciousness, vomiting, headache, and diplopia. Usually the X-ray report was negative. One hospital said that not only had he been an inpatient for three weeks last May but they now found that he had also been in with a similar condition in 1949. In one teaching hospital he had been admitted because of his story of having swallowed two safety-pins "whilst dressing the baby." An interesting point is that he had returned to several of these hospitals, especially in London, and done useful and voluntary weekend nursing from time to time.

He was told that the police were interested in the details of his accident—this was indeed the case—and that, since no organic cause could be found for his symptoms, he was to be transferred to a nearby mental hospital for further investigation. He immediately said that he was better and, within half an hour, he had discharged himself. He only had sevenpence in his pocket, so he was given a voucher to take him to his brother's town. His bed was filled by a more deserving casualty within an hour.

London, S.E.1. N. H. MOYNIHAN.

1. Doll, R. *Brit. J. Cancer*, 1953, **7**, 303.
2. Asher, R. *Lancet*, 1951, **i**, 339, and subsequent correspondence.

SPINAL TRACTION

SIR,—If, as Dr. Stoddard said last week, the effect of traction is to increase the height temporarily by $^1/_4$ in., would it not be logical to use some form of postural re-education to maintain at least some of the increased height so that it became permanent?

May not such re-education sometimes be sufficient in itself to persuade the disc back to its proper place? Is it not a fact that nearly everyone who has trouble of this kind is "slipped-disc prone" because of the way they use their backs? If so, does it not follow that an effective form of postural re-education should be extremely valuable as a preventive measure?

Having myself practised postural re-education for some years I cannot refrain from asking such questions. It seems to me that there is a gap here in medical technique which physiotherapy does not adequately fill. If, as a layman, I am exposing myself to professional rebuke I can at least answer: "Hippocrates, the great priest of medicine, advised the physicians to accept the help of the laity in the treatment of disease, but his advice has seldom been followed."

London, S.W.3. ERIC DE PEYER.

BALANTIDIASIS

SIR,—Balantidiasis is a rare disease and, as far as is known, has not previously been observed in or reported from the Persian Gulf. In well over 20,000 consecutive stool examinations, the balantidium has been seen in the stools of 7 patients. All were adult male Moslem Iranis, having no contact with pigs.

In the past, therapy has been unsatisfactory and there is no unanimity as to the best method. In 1944, Manson-Bahr[1] said that "at present treatment is purely empirical." The disease has many features in common with amœbiasis and it was thought justifiable to treat 6 of these patients with aureomycin in the doses recommended for amœbiasis. The other 1 was treated with methylene-blue (as described by Mackenzie and Bean[2]); no record of follow-up is available and it was not possible to trace him.

Subsequently, Burrows and Jahnes[3] have reported good results in 6 patients; 2 of them received 2 g. of aureomycin daily for fourteen days, and the other 4 had amounts varying from 17 g. in eleven days to 22·5 g. in a fortnight. These patients were followed up for periods of from two to twelve weeks. Hoekenga[4] has used terramycin in an adult dosage of 2 g. daily for ten days; and, with a minimal follow-up period of three months, an apparent cure was obtained in 9 out of 10 cases (reinfection being possible in the remaining case). Neghme et al.[5] gave aureomycin to 4 patients and terramycin to 1, and they obtained a good result in all cases.

Of the 6 patients treated with aureomycin, 5 had diarrhœa with blood and mucus in the stools, and in 3 ulceration of the colon was seen through the sigmoido-

1. Manson-Bahr, P. The Dysenteric Disorders. London, 1948; p. 257.
2. Mackenzie, D. L., Bean, H. *Lancet*, 1938, **i**, 84.
3. Burrows, R. B., Jahnes, W. G. *Amer. J. trop. Med. Hyg.* 1952, **1**, 626.
4. Hoekenga, M. T. *Ibid*, 1953, **2**, 271.
5. Neghme, A., Agosin, M., Christen, R., Rubio, M. *Exp. Parasit.* 1952, **1**, 189.

scope. All 6 were given 500 mg. of aureomycin twice daily for ten days. There were no toxic reactions or even unpleasant side-effects. Relief from symptoms was prompt, with rapid disappearance of the balantidium from the stools. The bowel ulcers were healed by the tenth day.

No relapse has been recorded, the period of follow-up varying from six weeks to six months: six months (2 patients), three months (1), two months (2), and six weeks (1) (5 stools were examined each month).

I am grateful to Dr. J. Guthrie, chief medical officer of the Kuwait Oil Co. Ltd., and to the management of the Company for permission to publish this report.

Kuwait, Persian Gulf. D. M. FORSYTH.

BACTERIAL WARFARE

SIR,—Those responsible for the defence of the country are no doubt well justified in carrying out present projects in the field of bacterial warfare. It is to be hoped, however, that medically qualified persons involved will have the tact to remove their names from the Medical Register. Such activity would appear to be quite contrary to the ethos of the Hippocratic oath.

Ilkley, Yorkshire. T. D. DAY.

Public Health

Epidemic Vomiting

AN outbreak of "epidemic vomiting" is reported from Ashby-de-la-Zouch in Leicestershire.[1] As is its custom,[2] the disease has attacked a girls' school, and 46 pupils and 5 teachers have been affected. A report is to be sent to the Minister of Health. We understand that mild gastro-intestinal symptoms have lately been prevalent in several schools in other parts of the country.

Paratyphoid Fever in Cardiff

On March 11 there were 70 patients with paratyphoid in hospital in Cardiff.[3] The outbreak [4] has been traced to confectionery containing artificial cream sold in Cardiff between Feb. 18 and 20.

Middlesex Report

Dr. A. C. T. Perkins, in his latest report as medical officer of health for Middlesex,[5] says that the lack of coördination between the various branches of the health service causes much avoidable suffering. A reason why sick people die before they can obtain admission to hospital is that beds are blocked by patients who might be discharged but for the lack of means of caring for them outside hospital. Officers equipped with wide powers to secure united action are needed. Dr. Perkins also calls attention to the lack of understanding among general practitioners of the health visitor's functions, and suggests that the Minister of Health might issue a statement on the subject.

In 1952 the death-rate for the county was 9·9 per 1000. Cancer accounted for almost 20% of all deaths, and 907 persons died of cancer of the lung compared with 386 from respiratory tuberculosis. Of these 907, 556 were under the age of 65. Maternal mortality was 0·55 per 1000 total births (equal to the previous year's low record) and infant mortality was 20·9 per 1000 live births against 28 for England and Wales.

Referring to the difficulty of getting medical staff for the public-health services, Dr. Perkins points out that junior posts are not available as in other branches of medicine. He suggests that some form of financial assistance should be given to the young doctor wishing to make public health his career.

1. *Times*, March 11, 1954.
2. See *Lancet*, 1953, ii, 714.
3. *Times*, March 12, 1954.
4. See *Lancet*, March 13, 1954, p. 568.
5. The Health of Middlesex, 1952: Annual Report of the County Medical Officer of Health, Administrative County of Middlesex.

Diary of the Week

MARCH 21 TO 27

Monday, 22nd

INSTITUTE OF NEUROLOGY, The National Hospital, Queen Square, W.C.1
5 P.M. Prof. D. Denny-Brown (U.S.A.): Positive and Negative Factors in Cortical Contribution to Movement.

MANCHESTER MEDICAL SOCIETY
5 P.M. (Dental Hospital, Bridge Street, Manchester, 15.) *Section of Odontology.* Dr. J. F. Wilkinson: Hæmorrhagic Diseases.
9 P.M. (Medical School, University of Manchester.) *Section of General Practice.* Dr. Charlotte Naish: Use of Cow's Milk in Breast-feeding.

Tuesday, 23rd

ROYAL COLLEGE OF SURGEONS, Lincoln's Inn Fields, W.C.2
5 P.M. Mr. D. M. Morrissey: Treatment of Obliterative Vascular Disease. (Hunterian lecture.)

ROYAL SOCIETY OF MEDICINE, 1, Wimpole Street, W.1
8 P.M. *Section of Medicine.* Dr. A. A. Miles, Prof. A. W. Downie, Prof. B. G. Maegraith: Clinical Aspects of Immunity.

INSTITUTE OF DERMATOLOGY, St. John's Hospital, Lisle Street, W.C.2
5.30 P.M. Mr. R. E. Billingham, D.PHIL.: Experimental Handling of Skin.

Wednesday, 24th

ROYAL SOCIETY OF MEDICINE
5 P.M. *Section of Endocrinology.* Dr. Oliver Garrod, Dr. I. C. Gilliland, Dr. Max Reiss, Dr. C. P. Haigh: Hypothyroidism.

ROYAL INSTITUTE OF PUBLIC HEALTH AND HYGIENE, 28, Portland Place, W.1
3.30 P.M. Dr. T. Rowland Hill: Diseases of the Nervous System in Relation to the Public Health.

INSTITUTE OF DERMATOLOGY
5.30 P.M. Dr. J. A. Dudgeon: Viral Diseases of the Skin.

SOCIETY OF APOTHECARIES OF LONDON, Black Friars Lane, Queen Victoria Street, E.C.4
5 P.M. Dr. Paul Wood: Appreciation of Mitral Valve Disease. (Strickland Goodall lecture.)

EUGENICS SOCIETY
5.30 P.M. (Burlington House, Piccadilly, W.1.) Dr. J. M. Tanner: Physique and Choice of Career.

MANCHESTER MEDICAL SOCIETY
4.30 P.M. (Medical School, University of Manchester.) Mr. Hedley Atkins: Problem of Cancer of Breast.

Thursday, 25th

ROYAL COLLEGE OF SURGEONS
5 P.M. Mr. J. B. Kinmonth: Lymphangiography in Clinical Surgery and Particularly in Treatment of Lymphœdema. (Hunterian lecture.)

ROYAL ARMY MEDICAL COLLEGE, Millbank, S.W.1
5 P.M. Prof. Ian Aird: Medical and Other Trends in Union of South Africa.

INSTITUTE OF CARDIOLOGY, National Heart Hospital, Westmoreland Street, W.1
9.30 A.M. Sir John Parkinson: Radioscopy of the Heart.

INSTITUTE OF DERMATOLOGY
5.30 P.M. Dr. Dudgeon: Viral Diseases of the Skin.

INSTITUTE OF NEUROLOGY
5 P.M. Professor Denny-Brown: Visuo-motor Mechanisms in Cerebral Cortex.

LONDON ASSOCIATION OF THE MEDICAL WOMEN'S FEDERATION
8.30 P.M. (Royal Free Hospital School of Medicine, 8, Hunter Street, Brunswick Square, W.C.1.) Miss Josephine Barnes, Dr. Sylvia Hatfield, Dr. Doris Odlum, Dr. Anne Hunter: What is the Future for Medical Women?

WEST LONDON MEDICO-CHIRURGICAL SOCIETY
7.45 P.M. (South Kensington Hotel, 41, Queen's Gate Terrace, S.W.7.) Sir Hugh Griffiths: The Doctor in the Witness-box.

Friday, 26th

ROYAL COLLEGE OF SURGEONS
5 P.M. Dr. Raymond Darget (Bordeaux): Treatment of Malignant Diseases of the Bladder.

ROYAL SOCIETY OF MEDICINE
5 P.M. *Section of Pædiatrics.* Dr. Peter Tizard, Dr. C. Ounsted, Dr. W. Cobb, Dr. L. Crome: Significance of Convulsions in Infancy and Childhood.
8.15 P.M. *Section of Obstetrics and Gynæcology.* Mr. C. W. A. Kimbell, Mr. W. R. Winterton, Mr. R. B. Rickford, Dr. J. Bamforth, Dr. M. Lederman: Carcinoma of Body of Uterus.

INSTITUTE OF DERMATOLOGY
5.30 P.M. Dr. Brian Russell: Epidermal Tumours—Nævoid, Benign, and Malignant.

INSTITUTE OF LARYNGOLOGY AND OTOLOGY, 330, Gray's Inn Road, W.C.1
3.30 P.M. Prof. F. C. Ormerod: Foreign Bodies in the Food and Air-passages.

INSTITUTE OF NEUROLOGY
5 P.M. Prof. G. H. Monrad-Krohn (Oslo): Emotional Innervation with Special Regard to Facial Hypermimia.

MEDICAL SOCIETY FOR STUDY OF VENEREAL DISEASES, 11, Chandos Street, W.1
7.30 P.M. Dr. F. Lanceley, Dr. J. G. Feinburg, Dr. M. G. McEntegart: Laboratory Aspects of *Trichomonas vaginalis*.

Saturday, 27th

RHEUMATISM UNIT, St. Stephen's Hospital, Fulham Road, S.W.10
10 A.M. Prof. S. J. Hartfall: The General Adaptation Theory (Opening address of week-end course on the rheumatic diseases.)

Notes and News

THE ROYAL SOCIETY OF ARTS

In celebrating its bicentenary next week, the Royal Society of Arts has much to be proud of. It originated in an idea which came to William Shipley (1714–1803), a drawing-master, when he inquired into the success of the horse-fair held twice a year at Northampton where he lived. The prosperity of horse-breeding, he was told, was largely due to the institution of race meetings, with prizes presented by the King and others; and it struck Shipley that, if one industry could be stimulated so greatly by the gift of comparatively few prizes, perhaps the same method could usefully be applied to others. Coming to London, he got an introduction to Stephen Hales, M.D., F.R.S., who encouraged him to prepare his leaflet "Proposals for raising by subscription a fund to be distributed in Premiums for the promoting of improvements in the liberal arts and sciences, manufactures, &c." After three months' hard canvassing he had secured fifteen supporters, and eleven of these fifteen, including Lord Romney, Lord Folkestone, and Dr. Hales, attended a gathering at Rawthmell's Coffee House, Henrietta-street, on March 22, 1754, which is generally regarded as the society's first meeting. Thus, as Mr. Luckhurst, the present secretary, points out,[1] the society's basis is the converse of that of almost all other societies: "Whereas others are founded to promote some definite *object*, and occupy themselves in finding the best means to promote that object, the Society of Arts was founded on a *means* and has occupied itself since in discovering the best objects to which to apply the means. . . . As we shall see later, the idea of premiums quickly gave birth to other ideas for the employment of the fund, but it is upon these various practical conceptions, and not upon their particular applications, that the long history of the Society hangs together."

The first premiums offered were for the production in this country of cobalt and madder, and for drawings by children under 14, and between 14 and 17 years old. Ten years later the prize competitions took 91 pages to print, and were in 380 classes—92 of them in agriculture. To encourage development in the American and West Indian colonies prizes were offered in 123 classes, ranging from dried sturgeons to sarsaparilla. By 1766 nearly £17,000 had been spent in prizes, and the influence of the competitions had extended of course far beyond the prize-winners. Mr. Luckhurst thinks that it can be claimed with confidence that they resulted in the reafforestation of very considerable areas, they played a predominant part in the earlier stages of the "agricultural revolution," they fostered the skill of draughtsmanship, and they stimulated the invention of many mechanical devices.

But, though for ninety years the prize competitions continued to be the main function of the society, they then began to lose their predominance in favour of other activities. About 1825 it began to be realised that often the best way to help the inventor was to give him the opportunity for publicity. Important competitions are still held from time to time; but in the past hundred years the society has made wide use of meetings, lectures, and reports, as means of introducing to the public new technical and scientific discoveries. It has also been interested in wider aspects of adult education, and it was the first body to draw attention to the need for technical education and to conduct technological examinations, which it held from 1873 until it handed them over to the City and Guilds of London Institute, in whose foundation it had an important share. Since 1854 it has conducted the leading examinations in commercial subjects.

An activity of perhaps even greater influence has been the holding of exhibitions, starting in 1760 when the society held the first public exhibition of contemporary art in this country and showed the way to the foundation of the Royal Academy eight years later. In 1761 the society held the first industrial exhibition—a display of agricultural machinery—and ninety years later, under the presidency of the Prince Consort, it could claim part of the credit for the Great Exhibition. Some of its smaller exhibitions, held in the beautiful building which the Adam brothers built for the society in 1774, will be recalled with pleasure by many.

As near neighbours in the Adelphi we take this opportunity of congratulating the society both on its ripe age and its continuing vigour. The subjects of the day are no longer the abolition of chimney-sweeping by small boys, the introduction of new crops or the need for cheap water-colour paintboxes; and the society no longer concentrates on the preservation of ancient cottages as it did in 1927. Interpreting its functions widely, it has indeed no one function; but trying always to answer the question "what can usefully be done now?" it provides stimulus after stimulus in the nation's life. Long may it continue such catalysis.

1. Luckhurst, K. W. William Shipley and the Royal Society of Arts. Published by the society, John Adam Street, Adelphi, London, W.C.2. Pp. 21. 1s.

THE CIBA FOUNDATION

The 1953 report gives details of the continued good work done by the Ciba Foundation, in giving accommodation to no fewer than 510 scientific workers visiting London, in awarding Anglo-French exchange bursaries, and particularly in holding symposia and publishing the results. Symposia were held on five subjects—namely, the preservation and transplantation of normal tissues; the peripheral circulation in man; the kidney; hypertension (humoral and neurogenic factors); and leukæmia research—and the proceedings are being published in London and in America. In addition, twelve informal evening discussions were held at 41, Portland Place, London, W.1.

Part of the valuable liaison work undertaken is the provision of information to U.S. and Canadian doctors in this country who want to know about facilities open to them here. The foundation hopes to keep an up-to-date list of the names and addresses of these visitors to Britain, and they are invited to communicate with the director, Dr. Gordon Wolstenholme, at the above address.

STABILITY OF PENICILLIN SOLUTIONS

The bacteriostatics subcommittee of the Conference on the Control of Antibiotics set up by the Ministry of Health in 1947 has issued a preliminary report on the stability of penicillin solutions containing sodium citrate. The stabilising power of sodium citrate was found to diminish with increasing concentration of penicillin. The results are summarised as follows:

1. Solutions containing 500,000 units per ml. of benzylpenicillin with 5% of sodium citrate did not retain their potency for 4 days at 25°C.
2. There was no significant loss of potency after 4 days at 25°C in solutions containing 100,000 units of benzylpenicillin stabilised with 4 or 5% of sodium citrate.
3. Solutions containing 50,000–500,000 units per ml. of benzylpenicillin stabilised with 4% of sodium citrate retained their potency for 8 days at 4°C.

The proportions of sodium citrate are expressed as percentages, weight in weight, of anhydrous trisodium citrate in the mixture of benzylpenicillin and sodium citrate used for preparing the solutions, and not as the percentage concentrations of sodium citrate in the solutions themselves.

THE VOLUNTEERS

Far from sinking and perishing in the Welfare State, voluntary services are growing; and local authorities are calling on them freely for help. The National Council of Social Service,[1] through its associated groups and committees, is deeply engaged in all these developments. Rural community councils are springing up in many parts of the country, and the Treasury is to help them with grants for the next seven years. Local committees have worked hard to collect funds to build village halls and community centres, and the N.C.S.S. has done much to keep these public-spirited people in good heart during the long years of restriction on building materials. Schemes for the building of temporary halls have been fostered, and volunteers have been helped, with plans and advice, to build their own halls out of materials not subject to controls. Over 1000 old people's welfare committees are now at work, and these are matched in number by the small friendly homes for old people maintained by voluntary bodies and local authorities. Citizens' advice bureaux are active, and there are still 475 of them. A temporary bureau, set up at Lynmouth after the flood disaster, was of great use to distressed and agitated people; and similar good work was done when the Eastern Counties suffered under storm and floods. Youth organisations have been exceptionally lively, and during the Coronation celebrations the youth department of the N.C.S.S. had the task of meeting and advising both young and older visitors from all over the world. Then there have been conferences to arrange and attend, pamphlets to publish, friendships to make with social workers at home and abroad, and plans to lay for future deeds and studies.

With such things to record, the annual report of the N.C.S.S. could and should be written with more appeal for

1. Annual report 1952-53. Obtainable from the council, 24, Bedford Square, London, W.C.1.

the ordinary reader, whose attention could be attracted by the vivid stroke of description or the revealing incident, which would bring it all to life. The illustrations are good —photographs of volunteers building their community centres; neglectful mothers learning (at Brentwood and Spofforth, those imaginative ventures, not mentioned elsewhere in the text) to look after their children; and a party of old people taking tea in a garden, under a flowering tree. But a body doing such splendid work should tell a better story.

CHARLES I AND RICKETS

AT a lecture at the National Portrait Gallery on March 13, Dr. J. J. Keevil described the childhood of Charles I with special reference to the severe rickets from which he suffered up to the age of 7. Most of the facts were new, being derived from the recently discovered correspondence of Dr. Henry Atkins, F.R.C.P.. The future king had a miserable and sickly childhood which not only affected his body—his final height was 5 ft. 4 in., his head was disproportionately large, and his legs were bowed—but gave him a sense of inadequacy when he had to take the place of his immensely popular brother, Henry, as heir to the throne. The Divine Right proved a refuge from this, but paradoxically this ivory tower was to prove his destruction. The Atkins papers show that rickets was not only a new disease, as stated by Whistler in 1645 and Glisson in 1650, but was so widespread in 1604, when Atkins first saw Prince Charles, as to be dismissed as a normal condition in childhood.

The lecture was illustrated by many portraits and photographs, showing how artists had disguised Charles's defects. The orthopædic boots worn by him as a child, and probably designed by Master Edward Stutavile, the bonesetter, were loaned from the London Museum.

University of London

Dr. D. M. Pryce, reader in morbid anatomy at St. Mary's Hospital Medical School, has been appointed to the university chair of morbid anatomy at that school.

Dr. Pryce received his medical education at Cardiff and at St. Mary's Hospital Medical School. After graduating as M.B. Lond. in 1926 he became assistant pathological chemist at St. Mary's Hospital and also held a research scholarship in the inoculation department of the hospital. Besides his readership at St. Mary's he is at present consulting pathologist to Harefield Hospital. He has published papers on intralobar sequestration of lung, on abscess cavities with ciliated epithelium, and on arteriovenous aneurysm of lung.

Mr. E. S. Perkins, Wernher research fellow at the Institute of Ophthalmology and senior registrar at St. Bartholomew's Hospital, has been appointed to the university readership in ophthalmology at the institute.

Mr. Perkins qualified from St. Bartholomew's Hospital in 1942. After holding house-appointments in the eye, ear, nose and throat departments at Barts he joined the R.A.M.C. in 1945 and served in East Africa as a graded ophthalmologist. In 1947 he took his M.B. Lond. and the D.O.M.S., and three years later the F.R.C.S. (ophthalmology). His published work includes papers on aqueous veins.

University of Aberdeen

Dr. Alexander Macdonald has been appointed to the chair of bacteriology in succession to Prof. John Cruickshank, who will retire at the end of September.

Dr. Macdonald, who is 43 years of age, went to Aberdeen Grammar School and Aberdeen University, where he graduated as M.A., with first-class honours and as M.B. with honours in 1937. After holding house-appointments at Aberdeen Royal Infirmary he became Garden research fellow in bacteriology in the university, and he was also assistant director of the North-East of Scotland blood-transfusion service. In 1942 he was appointed to the Emergency Public Health Laboratory Service in Cambridge and in the same year he graduated as M.D. with highest honours, obtaining the Thursfield award for his work on the pathogenic staphylococci. The following year he started the new public-health laboratory in Norwich, and he directed this unit for five years. He gave up his consultant post in 1948 to become reader in bacteriology in Liverpool. Dr. Macdonald has written many papers on bacteriological subjects, but latterly he has worked on viruses with Prof. A. W. Downie. His recent publications have dealt with toxoplasmosis, contagious pustular dermatitis, and the pox group of viruses, and last year he studied tissue-culture techniques at the Pasteur Institute in Paris.

Dr. Macdonald was for a time on the staff of this journal, and he is now an assistant editor of the *Journal of Pathology and Bacteriology*.

Faculty of Radiologists

At a recent examination for the fellowship the following were successful:

F. M. Benton, D. M. T. Cones, G. M. King, W. D. Rider (radiotherapy); K. E. Jefferson, K. A. Rowley, P. W. E. Sheldon (radiodiagnosis).

Royal College of Physicians of London

On Tuesday and Thursday, April 6 and 8, Dr. D. M. Dunlop will deliver the Lumleian lectures at the college, Pall Mall East, S.W.1, at 5 P.M. He will speak on the Complications of Diabetes.

Royal College of Surgeons of England

At a meeting of the council on March 11, with Sir Cecil Wakeley, president, in the chair, Prof. R. I. Harris (Toronto) and Dr. Donald Hunter (London Hospital) were appointed Sims Commonwealth travelling professors for 1955. Dr. Harris has been asked to visit Great Britain, Australia, and New Zealand. Dr. Hunter has agreed to visit Canada and Rhodesia. A Hunterian lectureship was awarded to Dr. Howard C. Naffziger (San Francisco). Dr. I. K. R. McMillan (St. Thomas's) was reappointed Mackenzie-Mackinnon research fellow for 1954–55. The Hallett prize was presented to A. Mitra (Calcutta), and the Handcock prize to Sheila C. Hay (Sheffield) and Margaret S. Meyer (Royal Free).

Mr. A. W. Kendall (King's College Hospital) and Mr. E. L. Farquharson (Edinburgh) were re-elected members of the court of examiners. Mr. R. R. Simpson (Hull) was elected to the fellowship "ad eundem." Dr. J. E. Gardiner (Leeds) was appointed junior lecturer in the department of pharmacology.

Prof. H. F. Humphreys will deliver the Webb-Johnson lecture on Friday, May 21, at 5 P.M., at the college, Lincoln's Inn Fields, London, W.C.2. He is to speak on the Value of the Teeth as Evidence—Scientific, Clinical, and Forensic.

Faculty of Anæsthetists.—Dr. Frankis Evans, Dr. W. W. Mushin, and Dr. H. J. V. Morton have been elected to the board of the faculty.

Third International Congress on Diseases of the Chest

This congress is to be held in Barcelona from Oct. 4 to 8 under the presidency of Dr. L. Rosal. Further particulars may be had from Dr. A. Caralps, secretary-general of the congress, Córcega 393, 4°, 1ª., Barcelona, Spain.

Medical Society of London

Proposing the health of "this lovable and venerable society" at the anniversary dinner on March 9, Colonel J. J. Astor recalled that it was founded at a time when the voluntary hospitals were springing up; when the idea of insuring life was taking root; when the *Times* newspaper was born; and when Thomas Lord was starting his cricket-ground. In those days knowledge was slight and enthusiasm for research was even slighter; but Lettsom had realised that the practice of medicine must be dynamic and that the principal part of knowledge must be derived from comparing observations one with another over the generations. The advance of medicine had gone hand in hand with the development of the hospital system, and no institution, perhaps, was of greater importance and national concern than the teaching hospital with its threefold function of teaching, treatment, and research. The teaching hospital must be free to develop on individual lines, and there was no lack of men of good will and wide business experience eager to contribute what they could to the tasks of management and organisation.

Mr. Eric Riches, the president, said that with 589 fellows the society had more than six times the establishment that Lettsom laid down 181 years ago—30 physicians, 30 surgeons, and 30 apothecaries—and in the past year the average attendance at meetings had been 93. Though in 1773 the society had been dedicated exclusively to the advance of medicine and surgery, the council interpreted this rule liberally. In twenty years Mr. Riches had never come away from a meeting without gaining some useful information and without enjoying it; and one of the society's most attractive features, he thought, was its faculty of dealing with subjects not of immediate concern to those attending. But its most important function was to promote unity and friendship among doctors —more necessary now than ever. Illustrating this need, as well as the difficulties facing younger men at a time when there may be as many as 50 applicants for a consultant post, Mr. Riches said that candidates now get to know each other so well that on one recent occasion in the Home Counties those attending for interview travelled down together in a bus which they hired jointly for the purpose. The successful candidate was excluded from the return journey.

Sir Harold Boldero proposed The Guests, and Dr. R. Cove-Smith responded.

Advisory Council on the Treatment of Offenders

The Home Secretary has appointed Dr. Denis Carroll to be a member of this council in place of Dr. Emanuel Miller, who has resigned.

Institute of Almoners

At the annual general meeting of this institute, which is to be held on Friday, March 26, at 6 P.M., at B.M.A. House, Tavistock Square, London, W.C.1, Prof. Leslie Banks will speak on Clients and Patients.

Guillebaud Committee

The closing date for the submission of written evidence to this committee is June 30. Anyone wishing to submit a memorandum should send it before that date to the secretary of the committee (Mr. E. Halliday), Ministry of Health, Savile Row, London, W.1.

Bristol Medical Exhibition

The annual regional exhibition of the London Medical Exhibition is to be held this year at Victoria Rooms, Bristol University, from May 17 to 21. It will be opened by Prof. C. Bruce Perry. Tickets may be had from the British & Colonial Druggist Ltd., 194, Bishopsgate, London, E.C.2.

Silliman Lectures

Prof. Ragnar Granit, director of the department of neurophysiology of the Medical Nobel Institute, at Stockholm, is to give the Silliman lectures for 1954 at Yale University, on April 29 and 30, and May 3, 4, 5, 6, and 7. He has chosen as his subject Receptors and Sensory Perception. This Silliman series will mark the 50th anniversary of Sir Charles Sherrington's lectures on the Integrative Action of the Nervous System.

Standards of Social Security

The Government propose to ratify a convention (No. 102) on minimum standards of social security which was adopted by the International Labour Conference in 1952. The convention lays down general requirements in nine branches of social security—medical care, benefit for sickness, unemployment, old age, employment injury, family, maternity, invalidity, and survivors. For each of these branches minimum standards as to the proportion of workpeople or of the population who must be protected are laid down and conditions for receiving benefit and the duration of benefit are specified. The convention also specifies the minimum rates of social-security benefits. The law and practice of the United Kingdom are in accord with the general requirements of the convention.

Royal Commission on Mental Laws

The Royal Commission on the Law relating to Mental Illness and Mental Deficiency is now ready to receive evidence on subjects within its terms of reference, which are:

"To inquire, as regards England and Wales, into the existing law and administrative machinery governing the certification, detention, care (other than hospital care or treatment under the National Health Service Acts, 1946–52), absence on trial or licence, discharge and supervision of persons who are or are alleged to be suffering from mental illness or mental defect, other than Broadmoor patients; to consider, as regards England and Wales, the extent to which it is now, or should be made, statutorily possible for such persons to be treated, as voluntary patients, without certification; and to make recommendations."

Anyone who wishes to submit evidence should send a memorandum in writing to the secretary of the Royal Commission at 23, Savile Row, London, W.1.

Biological Warfare

The Minister of Supply, Mr. Duncan Sandys, has issued the following statement:

During and since the war, successive Governments have had to consider methods of defence against all possible forms of attack, including even such forms as biological warfare which are expressly forbidden by the rules of war. Her Majesty's Government cannot neglect consideration of the precautions which would need to be taken should this form of warfare ever be applied against us. In recent years trials have been carried out off the coast of Scotland to obtain the technical data on which those precautions should be based.

It has been decided that certain further trials should be carried out in 1954 in Bahamas waters, where the climate and other circumstances are much more suitable. The area chosen is far out to sea, at least twenty miles from any inhabited island, and is widely removed from any normal shipping route. This decision has been taken after full consultation with, and with the full coöperation of, the local authorities.

Britain-China Friendship Association

At a meeting of this society on Wednesday, March 24, at 45, Russell Square, London, W.C.1, at 7.30 P.M., Dr. Horace Joules will speak on Social Medicine in China.

A memorial service for the late Dr. Gerald Horner, former editor of the *British Medical Journal*, is to be held at St. Pancras Church, London, on Friday, March 26, at NOON.

Sir John Parsons, F.R.C.S., F.R.S., has been elected an honorary member of the Illuminating Engineering Society.

The London Medical Orchestra, with Dr. H. Ucko as conductor, will give its first musical evening at B.M.A. House, Tavistock Square, W.C.1, on April 3, at 8 P.M.

CORRIGENDUM: *United Nations and World Population.*—In our annotation last week we spoke of "the conference on world population which the United Nations is holding in Sweden next September." This conference is in fact to be held in Rome. Our reference to Dr. Evang's paper should have read *Eugen. Rev.* 1954, **45**, 247.

Appointments

BISHOP, J. B., T.D., B.M. Oxfd: S.H.M.O., Broadmoor Institution, Crowthorne.
BLOMFIELD, L. B., M.R.C.S., D.PHYS.MED.: hon. physician, French Hospital and Dispensary, London.
EVANS, ANNIE, M.B., B.SC. Wales: asst. M.O., Newport, Mon.
HANDY, ROBERT, M.B. Lond.: asst. county M.O. and deputy M.O.H., borough of High Wycombe, and Marlow urban and Wycombe rural districts.
HOUGHTON, E. A. W., M.B. Brist.: medical registrar, Southmead Hospital, Bristol.
KNAPMAN, W. B., M.R.C.S.: part-time psychiatrist, Bowden House, Harrow.
LUMEY, J. L. J., M.B. Edin.: senior registrar, Broadmoor Institution, Crowthorne.
MACARTHUR, PATRICK, M.D. Glasg., F.R.F.P.S., D.C.H.: consultant pædiatrician, Northern Regional Hospital Board.
ROGERS, W. J. B., M.B. Camb., D.P.M.: whole-time consultant child psychiatrist, Crichton Royal, Dumfries.
SLEIGH, BEATRICE E., M.B. Manc., D.A.: anæsthetic registrar, Frenchay Hospital, Bristol.
WILLIAMS, NORMAN, M.B. Lond., D.P.H., D.I.H.: S.M.O., East Midlands Gas Board.

Manchester Regional Hospital Board:

ANDREWS, H. B., M.B. Lpool: deputy superintendent and R.M.O., Wrightington Hospital.
BOLTON, HAROLD, M.B. Manc., F.R.C.S.: consultant orthopædic and accident surgeon, Stockport and Macclesfield hospital centres and Crewe Memorial Hospital.
FULTON, R. M., M.D. Edin., M.R.C.P.: consultant physician, Stockport and Buxton Hospitals.
GUPTA, K. SEN, M.B. Calcutta, D.A.: asst. anæsthetist, Bury and Rossendale Hospitals.

Newcastle Regional Hospital Board:

BUCKLEY, F. J. S., M.B. Sydney: senior casualty officer, Stockton and Thornaby Hospital.
FRY, E. N. S., M.B. Edin., D.A.: consultant anæsthetist, Tees-side H.M.C. group.
HENDTLASS, R. F., F.R.C.S.E.: senior casualty officer, Middlesbrough General Hospital.
JOHNSTON, N. G., M.B. St. And., D.A.: senior consultant anæsthetist, Bishop Auckland General Hospital.
QUINN, P. J. G., M.R.C.P.I.: asst. psychiatrist, St. George's Hospital, Morpeth.
SCOTT, J. M., M.B. Glasg., F.R.F.P.S.: senior casualty officer, Monkwearmouth and Southwick Accident and Orthopædic Hospital.
WILDER, EMMANUEL, M.B. Polish School of Medicine, Edin.: asst. pathologist, Hartlepools H.M.C.

Appointed Factory Doctors:

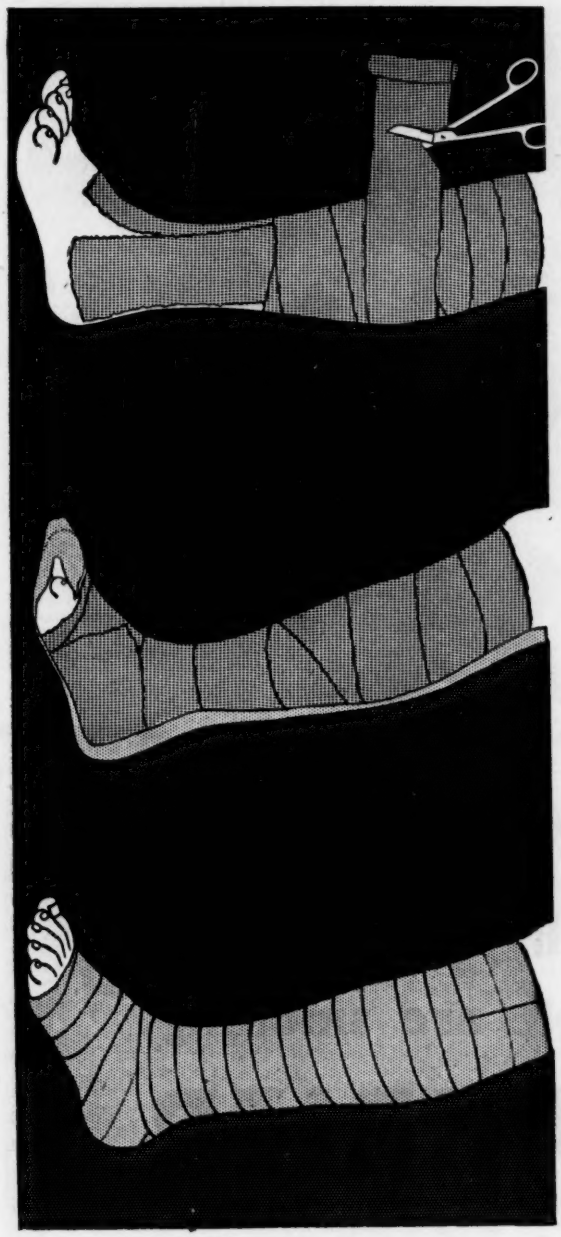
BERRY, G. H., L.R.C.P.E., L.R.F.P.S. Glasg.: Melksham, Wiltshire.
DICKIE, G. G., M.B. Aberd., D.P.H.: Rhynie, Aberdeen.
KIRK, J. L., M.B. Glasg.: Irvine, Ayr.
MILLER, HUGH, M.D. Edin.: Leith, Midlothian.
UNSWORTH, C. E., M.B. Lpool: Frodsham, Chester.

Births, Marriages, and Deaths

BIRTHS

ROBERTS.—On March 12, at University College Hospital, London, W.C.1, to Phyllida (formerly Thornton), M.D., wife of Paul Roberts, M.B.—a daughter.

WE record with regret the death of Mr. W. W. Moody, for thirty-nine years a member of our staff. He retired from THE LANCET in 1940, at the age of 70; but until lately he was able to visit his friends at the office. Neither age nor ill health had been allowed to impair the kindliness and cheerfulness for which he will be remembered among us.



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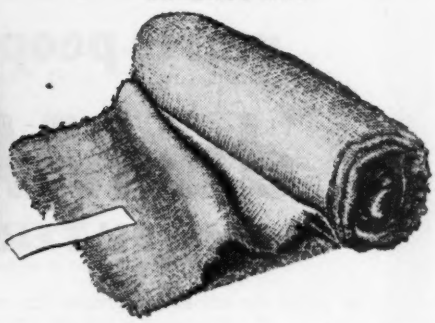

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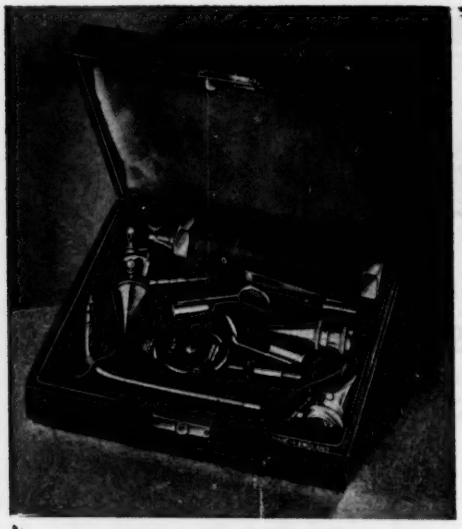

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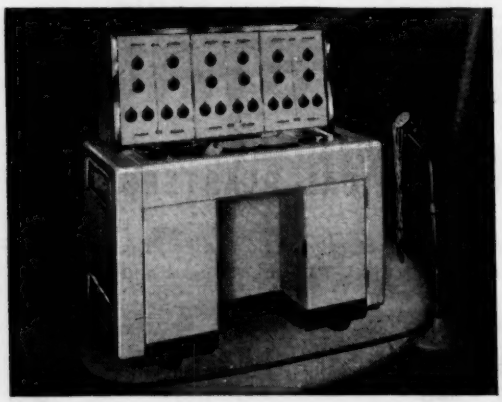

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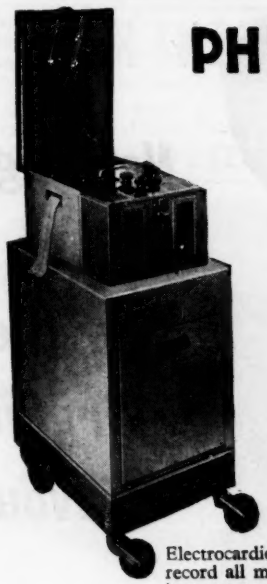

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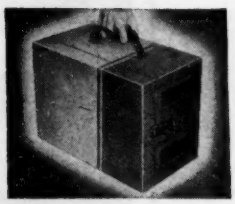

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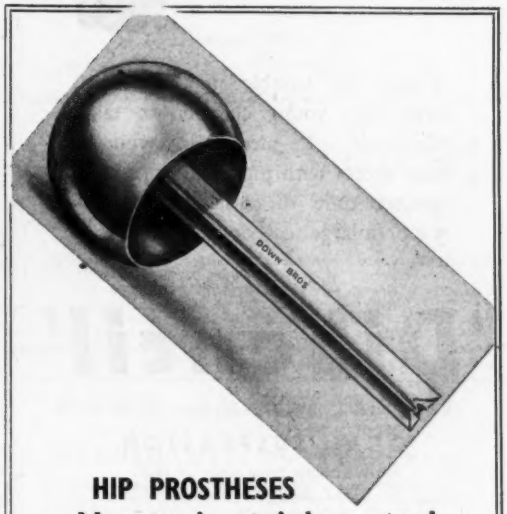

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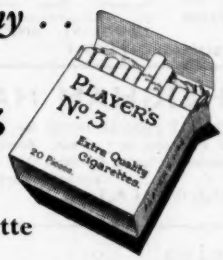

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Academic and Educational

ROYAL COLLEGE OF SURGEONS OF ENGLAND

COURT OF EXAMINERS

Notice is hereby given that the Council, on 20TH MAY, 1954, will elect 2 Members of the Court of Examiners. Of the Examiners retiring in rotation one (Mr. R. L. Holt, O.B.E.) does not seek re-election.

Fellows of the College desirous of becoming candidates for the office must make application in writing to the Secretary on or before 31st March, 1954. KENNEDY CASSELS, Secretary.

Lincoln's Inn-fields, London, W.C.2.

THE UNIVERSITY OF LEEDS

Applications are invited for IMPERIAL CHEMICAL INDUSTRIES LIMITED RESEARCH FELLOWSHIPS in Bacteriology, Biochemistry, Biomolecular Structure, Botany (Plant Biochemistry and Biophysics), Chemical Engineering, Chemistry, Chemistry of Leather Manufacture, Chemotherapy, Colour Chemistry and Dyeing, Engineering (Civil, Electrical, or Mechanical), Fuel and Refractories, Geology (including Geochemistry), Metallurgy, Mining (Selective Flotation and Geophysical Surveying), Pharmacology, Physics, Physiology, or Textile Industries (Protein Chemistry and Wool Textile Engineering). The Fellowships will be of an annual value within the range £600–£900 a year according to qualifications and experience, and will normally be tenable for 3 years. Further particulars can be obtained on request.

Applications (3 copies—1 in the case of applicants from overseas), together with the names of 2 referees, should reach the Registrar, The University, Leeds, 2, not later than 21st April, 1954.

COURSE IN ADVANCED CLINICAL ORTHOPÆDICS

at the

INSTITUTE OF ORTHOPÆDICS

29TH MARCH–3RD APRIL, 1954

29th March Town Section	Manipulation	Mr. H. J. BURROWS
	Tendon surgery	Mr. J. I. P. JAMES
	Joint biopsy	Dr. H. A. SISSONS
	The painful foot	Mr. K. I. NISSEN
30th March Country Section	Medical aspects of joint tuberculosis	Dr. F. H. STEVENSON
	Laboratory studies of joint diseases	Dr. C. H. LACK
31st March Town Section	Recurrent dislocation of shoulder	Mr. D. TREVOR
	Painful shoulder	Mr. D. TREVOR
	Clinical demonstration	Mr. A. T. FRIPP
1st April Country Section	Tuberculosis of the knee and hip	Mr. J. A. CHOLMELEY
	Clinical demonstration	Mr. P. H. NEWMAN
2nd April Country Section	Use of plastics in orthopædics	Dr. J. T. SCALES
	Biochemistry of joint diseases	Dr. L. E. GLYNN
3rd April Country Section	Plastic surgery in orthopædics	Mr. R. L. G. DAWSON

The fee for the course (including lunch and tea) is 7 guineas.

Early application should be made to the Dean, at 234, Great Portland-street, W.1.

THE ROYAL INSTITUTE OF PUBLIC HEALTH AND HYGIENE

THE CERTIFICATE, AND THE DIPLOMA, IN PUBLIC HEALTH, AND THE DIPLOMA IN INDUSTRIAL HEALTH

The next bi-annual Course of Instruction for the Certificate in Public Health (C.P.H.) commenced on 19TH MARCH, 1954, though applications for enrolment can still be considered if received within the next 10 days. This leads to Courses both for the Diploma in Public Health and for the Diploma in Industrial Health. All Courses may be taken either whole-time or part-time.

Prospectuses, enrolment forms, and full details may be obtained from the Secretary, 28, Portland-place, London, W.1 (Telephone: LANgham 2731–2).

NUFFIELD FOUNDATION DOMINION TRAVELLING FELLOWSHIPS

NEW ZEALAND

The Nuffield Foundation offers a Travelling Fellowship in Medicine to nationals of New Zealand, preferably between the ages of 25 and 35 years. The purpose is to enable medically qualified persons to obtain in the United Kingdom such post-graduate training and experience as may be necessary to prepare them to undertake medical teaching and research work in New Zealand. Applicants should possess high intellectual and personal qualities.

A Fellow will be required to carry out at an approved institution a programme of work and training approved by the Nuffield Foundation. A Fellow will not be permitted to prepare for, or to take examinations for, higher degrees or diplomas awarded by bodies in the United Kingdom.

The Fellowships are normally tenable for 1 year, and provide for return travelling expenses of a Fellow and, if he is married, for his wife. The total value of an award, including travelling expenses, varies with the needs and family responsibilities of the holder, but will in no case be less than £900.

Applications for Fellowships to begin in 1954 should be submitted not later than 30th April, 1954, to the undersigned. Copies of the conditions and forms of application are also available at the Nuffield Foundation, Nuffield Lodge, Regent's Park, London, N.W.1. R. E. CORBETT.

Department of Chemistry, University of Otago, Dunedin, New Zealand.

ROYAL LONDON HOMŒOPATHIC HOSPITAL

Great Ormond-street and Queen-square, W.C.1

COURSES OF INSTRUCTION IN THE PRINCIPLES AND PRACTICE OF HOMŒOPATHY FOR MEDICAL PRACTITIONERS AND SENIOR STUDENTS OF MEDICINE

SUMMER COURSE, 1954

TUESDAYS, commencing 27TH APRIL, 1954:—
2 P.M., Repertorial Analysis.
3 P.M., Materia Medica of the Polycrests.
4 P.M., Illustrative Case Records.

FRIDAYS, commencing 30TH APRIL, 1954:—
2 P.M., Materia Medica.
3 P.M., Illustrative Case Records.

During the week commencing 3RD MAY, 1954, Lectures will be given on Bowel Nosodes and the Emanometer Grouping of Drugs.

Fee for registered medical practitioners, £10 10s. Medical students admitted without charge.

Further particulars can be obtained on application to the Dean of the Education Course at the Hospital.

BRITISH EMPIRE CANCER CAMPAIGN invites applications from suitably qualified British subjects for EXCHANGE FELLOWSHIPS IN CANCER RESEARCH during 1954–55. Fellowships are of 1 years tenure in the United States of America at a stipend of $4000 p.a., which will be paid by the American Cancer Society. Travelling expenses to and from centre of work will be borne by the Campaign.

For further particulars and application forms apply to the Secretary-General, British Empire Cancer Campaign, 11, Grosvenor-crescent, Hyde Park Corner, London, S.W.1. The closing date for the receipt of applications is 1st April, 1954.

UNIVERSITY OF LONDON. The Senate invite applications for the CHAIR OF PHYSIOLOGY tenable at Queen Elizabeth College (salary not less than £1800 a year).

Applications (10 copies) must be received not later than 6th May, 1954, by the Academic Registrar, University of London, Senate House, W.C.1, from whom further particulars should be obtained.

UNIVERSITY OF LONDON POSTGRADUATE MEDICAL SCHOOL. ASSISTANT LECTURER IN BACTERIOLOGY required. Duties will consist of teaching and participation in clinical bacteriological routine. Opportunities for research available. Salary scale £1000–£100–£1400 p.a.

Applications, giving particulars of experience and the names of 3 referees, should be sent, by mid-April, to the Dean, Postgraduate Medical School, Ducane-road, W.12, from whom further particulars can be obtained.

UNIVERSITY OF LONDON POSTGRADUATE MEDICAL SCHOOL. Locum REGISTRAR (bacteriology) required immediately for 6 months. Duties include routine work and demonstrations to the D.C.P. course. Salary £775 or £890, according to experience.

Applications, with the names of 2 referees, to the Dean, Postgraduate Medical School, Ducane-road, W.12, by 1st April.

UNIVERSITY OF ABERDEEN. Applications are invited for a LECTURESHIP IN PUBLIC HEALTH. Candidates must hold the Diploma in Public Health or its equivalent, and have had practical experience in Public Health and/or Industrial Health. Salary £1000–£100–£1300 (initial placing according to qualifications and experience), with F.S.S.U. and children's allowances. Part of furniture removal expenses to Aberdeen refunded.

Conditions of appointment and forms of application should be obtained from the undersigned, with whom applications (8 copies) should be lodged by 10th April, 1954. Applicants outside the British Isles may submit 1 copy of application.

The University, Aberdeen. W. S. ANGUS, Secretary.

Hospital Services: Senior Appointments

KING'S COLLEGE HOSPITAL, Denmark-hill, S.E.5. Applications are invited for the post of CONSULTANT OBSTETRIC AND GYNÆCOLOGICAL SURGEON. The post is a part-time one for 3 sessions a week. Candidates must be Members or Fellows of the Royal College of Obstetricians and Gynæcologists and should be Fellows of the Royal College of Surgeons. The appointment is subject to the terms and conditions of service for hospital medical and dental staffs and to the National Health Service (Superannuation) Regulations, 1950–1952.

Applications (12 copies), giving details of age, qualifications, and experience, and with the names of 3 referees, should be sent to the undersigned not later than 17th April, 1954.

S. W. BARNES, House Governor.

NORTH EAST METROPOLITAN REGIONAL HOSPITAL BOARD.

Part-time CONSULTANT OBSTETRICIAN AND GYNÆCOLOGIST, Forest Gate Hospital, E.7 (2 sessions a week).

Full-time CONSULTANT PATHOLOGIST, Oldchurch and other hospitals in the Romford, Essex, Group. Residence in the Group area is a requirement of the appointment.

Full-time ASSISTANT PATHOLOGIST (Senior Hospital Medical Officer grade), Rush Green Hospital, Romford, Essex. The appointment covers all branches of pathology at this hospital of 301 Beds. Residence in the Group area is a requirement of the appointment.

Applications (6 copies), stating post concerned and names of 3 referees, should reach the Secretary, 11A, Portland-place, London, W.1, by Saturday, 3rd April.

CAMBRIDGE. THE UNITED CAMBRIDGE HOSPITALS. CONSULTANT in General Surgery required from 1st October, 1954, to undertake maximum part-time duties mainly at Addenbrooke's Hospital.

Applications (10 copies), stating age, nationality, and present and past appointments, with names of 3 referees, to Secretary, United Cambridge Hospitals, Addenbrooke's Hospital, Cambridge, by 10th April.

NORTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD.

ASSISTANT PHYSICIAN (whole-time), Colindale Hospital, The Hyde, N.W.9. Hospital has 240 Beds for treatment of pulmonary tuberculosis. Candidates should have good general medical experience and special experience in treatment of pulmonary tuberculosis. Salary scale £1300 (at age 32)–£1750.

Detailed applications by 20th April, 1954.

Hospital may be visited by direct appointment.

Applications (3 referees) to Secretary, North West Metropolitan Regional Hospital Board, 11A, Portland-place, W.1.

BRISTOL. UNITED BRISTOL HOSPITALS. Applications are invited for the whole-time post of CONSULTANT RADIOLOGIST in the United Bristol Hospitals. The successful candidate will work as Assistant to the Director of Radiology and will be given academic status in the University of Bristol. The terms and conditions of service negotiated between the Ministry and the Profession will apply to the appointment. Applicants must hold a Diploma in Diagnostic Radiology and a higher qualification.

Applications, stating age, particulars of education, qualifications and experience, with the names of 3 referees, should be sent by Tuesday, 20th April, 1954, to—

STEPHEN C. MERIVALE,
Secretary to the Board of Governors.

Bristol Royal Infirmary, Bristol, 2.

LEEDS REGIONAL HOSPITAL BOARD. Whole-time SENIOR HOSPITAL MEDICAL OFFICER in Thoracic Medicine for the Middleton, Bradford A and Leeds B Management Committee Groups. The person appointed will be a member of a team concerned with the surgical treatment of tuberculosis in sanatoria and chest hospitals and will be expected to devote special attention to the aftercare of tuberculous thoracic surgical cases. Extensive experience in tuberculosis and chest radiography is essential and previous experience in a thoracic surgical unit is desirable.

Applications (10 copies), stating age, qualifications and details of appointments held showing dates, with names and addresses of 3 referees, to the Secretary, Park-parade, Harrogate, not later than 9th April, 1954.

LIVERPOOL REGIONAL HOSPITAL BOARD. Walton HOSPITAL. Applications are invited for the post of Whole-time ASSISTANT PATHOLOGIST with duties at the above Hospital. Applicants should have general all-round experience in clinical pathology. The possession of a higher degree will be considered an advantage. The successful candidate will work under the direction of the Consultant Pathologist. Salary £1300 (at age 32)–£50–£1750 p.a.

Forms of application from, and to be returned to, Dr. T. Lloyd Hughes, Senior Administrative Medical Officer, Liverpool Regional Hospital Board, 19, James-street, Liverpool, 2, to be received not later than 10th April, 1954.

VINCENT COLLINGE, Secretary to the Board.

AMENDED ADVERTISEMENT

LIVERPOOL REGIONAL HOSPITAL BOARD. Birkenhead and North Wirral Areas. Applications are invited for the post of CONSULTANT RADIOLOGIST with duties mainly at St. Catherine's Hospital, Birkenhead, and Victoria Central Hospital, Wallasey, but will include sessions at other hospitals in the Area. The appointment is whole-time or part-time on maximum sessions according to the choice of the successful candidate, who should possess a D.M.R. and have had wide experience in radiology.

Forms of application from, and to be returned to, Dr. T. Lloyd Hughes, Senior Administrative Medical Officer, Liverpool Regional Hospital Board, 19, James-street, Liverpool, 2, to be received not later than 27th March, 1954.

VINCENT COLLINGE, Secretary to the Board.

LIVERPOOL REGIONAL HOSPITAL BOARD. Deva HOSPITAL, near CHESTER. Applications are invited for the post of Whole-time ASSISTANT PSYCHIATRIST with duties at the above Hospital, including attendance at Outpatient Clinics outside the Hospital. Applicants should possess the D.P.M. or an equivalent qualification and have had reasonable experience in psychiatry including practical knowledge of outpatient work. Married accommodation is available at a charge to be arranged. Salary £1300 (at age 32)–£50–£1750 p.a.

Forms of application from, and to be returned to, Dr. T. Lloyd Hughes, Senior Administrative Medical Officer, Liverpool Regional Hospital Board, 19, James-street, Liverpool, 2, to be received not later than 10th April, 1954.

VINCENT COLLINGE, Secretary to the Board.

SCOTLAND. WESTERN REGIONAL HOSPITAL BOARD. Applications are invited for the following appointments :—

Whole-time ASSISTANT OPHTHALMOLOGIST based at Glasgow Eye Infirmary with duties elsewhere in the Region as may be required. Salary on the scale £1300–£50–£1750.

PHYSICIAN-SUPERINTENDENT AND WHOLE-TIME CONSULTANT PSYCHIATRIST, Gartloch Hospital, Gartcosh, Glasgow. The person appointed will be required to take up duty in October, 1954. A house will be available.

Whole-time ASSISTANT PATHOLOGIST based at Kilmarnock Infirmary with duties elsewhere in the Ayrshire Area as may be required. Salary on the scale £1300–£50–£1750.

Whole-time ASSISTANT RADIOLOGIST based at Law Hospital, Carluke. Salary on the scale £1300–£50–£1750.

Whole-time ASSISTANT TUBERCULOSIS PHYSICIAN for duties in the Tuberculosis Service of the City of Glasgow. Salary on the scale £1300–£50–£1750.

These appointments are subject to the National Health Service (Scotland) superannuation regulations.

Applications (16 copies), stating date of birth, qualifications, experience, present appointment, and the names of 3 referees, to reach the Secretary, Western Regional Hospital Board, 64, West Regent-street, Glasgow, not later than 30 days after the publication of this advertisement.

MANCHESTER REGIONAL HOSPITAL BOARD.

(*a*) Whole-time CONSULTANT CHEST PHYSICIAN AND PHYSICIAN-SUPERINTENDENT of Baguley Hospital, near Manchester (400 Beds for pulmonary tuberculosis). The main Regional centre for the surgical treatment of pulmonary tuberculosis is at Baguley Hospital and there is also a new Chest Clinic adjacent to the Hospital serving the Wythenshawe area of which the Physician-Superintendent will have charge. Ample facilities for clinical research. A very good detached family house available in the grounds at reasonable rental. The Board would consider an application for maximum part-time service after 3 years. Membership of a Royal College of Physicians essential.

(*b*) Whole-time NON-RESIDENT ASSISTANT RADIOTHERAPIST at Christie Hospital and Holt Radium Institute, Manchester. Candidates must possess the D.M.R.(T.). Successful candidate will be required to live in or near Manchester. Salary £1300–£50–£1750 p.a.

Application forms from the Senior Administrative Medical Officer, Cheetwood-road, Manchester, 8, to be returned by 17th and 10th April, 1954, respectively.

SHEFFIELD REGIONAL HOSPITAL BOARD. Maximum Part-time CONSULTANT ANÆSTHETIST required for the Rotherham and Mexborough Hospital Management Committee Group (Doncaster Gate Hospital (155 Beds); Moorgate Hospital, Rotherham (358 Beds); and Montagu Hospital, Mexborough (123 Beds)).

Application forms and further details from Senior Administrative Medical Officer, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield. Forms to be returned by 17th April, 1954.

SHEFFIELD REGIONAL HOSPITAL BOARD. ConSULTANT ANÆSTHETIST required for 8 notional half-days per week at the Royal Hospital, Chesterfield (257 Beds) and the Victoria Hospital, Worksop (127 Beds).

Application forms and further details from Senior Administrative Medical Officer, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield. Forms to be returned by 10th April, 1954.

SHEFFIELD REGIONAL HOSPITAL BOARD. Whole-time ASSISTANT PATHOLOGIST to the Leicester Royal Infirmary with duties also at the Leicester Isolation Hospital and Chest Unit. Salary £1300–£50–£1750. Candidates must have experience in all branches of laboratory work, experience in morbid histology would be an advantage.

Application forms and further details from Senior Administrative Medical Officer, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield. Forms to be returned by 10th April, 1954.

SCOTLAND. NORTHERN REGIONAL HOSPITAL BOARD. Applications are invited for the whole-time post of ASSISTANT ANÆSTHETIST, based on the Inverness Hospitals. Salary scale is £1300–£50–£1750 p.a. Candidates should have a Diploma in Anæsthetics.

Schedules of application and further particulars may be obtained from the undersigned, with whom applications should be lodged by 31st March, 1954.

A. M. FRASER, M.D.,
Secretary and Administrative Medical Officer.

Office of the Northern Regional Hospital Board,
Raigmore, Inverness.

SHREWSBURY AND WOLVERHAMPTON GROUPS OF HOSPITALS. Whole-time CONSULTANT CHILD PSYCHIATRIST. Duties on behalf of Salop County Council (7 notional half-days weekly) principally in diagnosis and treatment of maladjusted children (including participation in work of Local Education Authority's Child Guidance Team) and in connection with Child Guidance Service, Wolverhampton County Borough (2 notional half-days). Appointment linked with Shelton Hospital, Shrewsbury (2 notional half-days). Wide experience including good experience or training in child psychiatry essential.

Applications (15 copies), stating name, age, nationality, qualifications, present and previous appointments and details of 3 referees, to Secretary, Birmingham Regional Hospital Board, 10, Augustus-road, Birmingham, 15, before 5th April, 1954.

SOUTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD requires Part-time CONSULTANT E.N.T. SURGEON (2 half-days per week) for the Croydon Group. Duties mainly at Mayday Hospital, 1 operative session included.

Applications (5 copies), giving date of birth, qualifications, experience, and names of 3 referees, to Secretary (S.1.), South West Metropolitan Regional Hospital Board, 11A, Portland-place, W.1, by 20th April, 1954. Applicants may visit Hospital by local arrangement.

SOUTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD requires Whole-time CONSULTANT PATHOLOGIST for the Chichester Group. Consultant appointed will be required to work, under the Senior Pathologist, in the 3 laboratories of the Royal West Sussex and St. Richard's (General) and Graylingwell (Mental) Hospitals. Candidates should have a general knowledge of clinical pathology, preferably with a wish to specialise in haematology or histology.

Applications (5 copies), giving date of birth, qualifications, experience, and names of 3 referees, to Secretary (S.1), South West Metropolitan Regional Hospital Board, 11A, Portland-place, W.1, by 20th April, 1954. Applicants may visit Laboratories by local arrangement.

WALSALL GROUP OF HOSPITALS. Part-time ConSULTANT ANÆSTHETIST (9 notional half-days weekly). Duties mainly at General and Manor Hospitals, Walsall. Higher anesthetic qualification and experience specialty required.

Applications (15 copies), stating name, age, nationality, qualifications, present and previous appointments, and details of 3 referees, to Secretary, Birmingham Regional Hospital Board, 10, Augustus-road, Birmingham, 15, before 5th April, 1954.

WALSALL, WEST BROMWICH, AND BIRMINGHAM (MENTAL A) GROUP OF HOSPITALS. Whole-time CONSULTANT CHILD PSYCHIATRIST. Duties at Child Guidance Clinics on behalf of the County Boroughs of Walsall (4 notional half-days weekly) and West Bromwich (4 notional half-days). Appointment linked with Winson Green Hospital, Birmingham (3 notional half-days). Special training in child guidance work and wide experience psychiatry required.

Applications (15 copies), stating name, age, nationality, qualifications, present and previous appointments, and details of 3 referees, to Secretary, Birmingham Regional Hospital Board, 10, Augustus-road, Birmingham, 15, before 5th April, 1954.

NORTHERN IRELAND HOSPITALS AUTHORITY invite applications for a whole-time post as CONSULTANT CLINICAL PATHOLOGIST at the Belfast City Hospital. The terms and conditions of the appointment will be in accordance with the Authority's application to Northern Ireland of the Spens report.

Application should be made on a form which may be obtained (with further particulars) from the Secretary, Northern Ireland Hospitals Authority, Victory Buildings, 44–46, Queen-street, Belfast, and which must be returned so as to be received not later than 17th April, 1954.

NORTHERN IRELAND HOSPITALS AUTHORITY invite applications for the post of ANÆSTHETIST in the grade of Senior Hospital Medical Officer to hospitals managed by the Fermanagh Hospital Management Committee. The appointment will be on a part-time basis of 9 half-days of duty weekly. The terms and conditions of the appointment will be in accordance with the Authority's application of the Spens Report to Northern Ireland.

Applications should be made on a form which may be obtained (with further particulars) from the Secretary, Northern Ireland Hospitals Authority, Victory Buildings, 44–46, Queen-street, Belfast, and will be received not later than 23rd April, 1954.

NORTHERN IRELAND HOSPITALS AUTHORITY invite applications for the post as ANÆSTHETIST in the grade of Senior Hospital Medical Officer to the North Antrim Group of hospitals. The appointment will be on a part-time basis of 9 half-days of duty weekly. The terms and conditions of the appointment will be in accordance with the Authority's application of the Spens report to Northern Ireland.

Applications should be made on a form which may be obtained (with further particulars) from the Secretary, Northern Ireland Hospitals Authority, Victory Buildings, 44–46, Queen-street, Belfast, and will be received not later than 23rd April, 1954.

TORONTO, CANADA. NEW MOUNT SINAI HOSPITAL. This modern 350-Bed Hospital has an immediate opening for an ASSISTANT PATHOLOGIST in the Autopsy and Surgical Pathology Service. The laboratories are superbly equipped with facilities for photomicrography, research, &c. Salary $3600 p.a. to commence.

Applications should be directed to the Director of Laboratories, New Mount Sinai Hospital, 550, University-avenue, Toronto 2, Ontario, Canada. Please give all pertinent information when applying and enclose photograph.

Hospital Services : Junior Appointments

CENTRAL MIDDLESEX HOSPITAL, Park Royal, N.W.10. SENIOR HOUSE OFFICER (Anæsthetist), whole-time, resident, for 6 months from 1st May, 1954, renewable. Previous experience in anæsthesia essential and possession of Part I of the D.A. an advantage. The Hospital is recognised for the Diploma.

Applications, with copies of testimonials or names of 2 referees, to Medical Director by 3rd April, 1954.

CENTRAL MIDDLESEX HOSPITAL, Park Royal, N.W.10. SENIOR HOUSE OFFICER in General Medicine required with duties mainly in the Geriatric Department. Good facilities for higher examination and insight into working of general practice. Whole-time appointment for 6 months in first instance. Post vacant 5th April, 1954.

Applications, with copies of 2 testimonials, to Medical Director by 3rd April, 1954.

CHARING CROSS HOSPITAL, W.C.2. Casualty Officer (Senior House Officer). Tenable from 28th April to 14th June, 1954, inclusive.

Application forms, obtainable from the undersigned, to be returned by 5th April, 1954.

FRANK HART, House Governor and Secretary to the Board.

HAMMERSMITH HOSPITAL AND INSTITUTE OF OBSTETRICS AND GYNÆCOLOGY, Ducane-road, London, W.12. Whole-time NON-RESIDENT REGISTRAR (obstetrics and gynæcology) required 28th June. The successful candidate, who should possess the M.R.C.O.G., will be required to spend first year at Hammersmith Hospital, and if appointment renewed, second year at Luton Maternity Hospital.

Applications, stating age, qualifications, experience, names of 2 referees, to Secretary, Board of Governors, by 24th April.

HAMPSTEAD GENERAL HOSPITAL, The Green, N.W.3. (ROYAL FREE HOSPITAL GROUP.) Applications are invited from registered medical practitioners (Male and Female) for the post of RESIDENT CASUALTY OFFICER (graded as Senior House Officer). Salary £670 p.a. Vacant 1st April, 1954, tenable for a period of 6 months at the Main Outpatients Department, Bayham-street, N.W.1. This post gives time for study.

Application forms may be obtained from the Administrative Officer, to whom they should be returned immediately, together with copies of 3 recent testimonials.

HACKNEY HOSPITAL, London, E.9. (General—844 Beds.) Applications from registered medical practitioners for the posts of HOUSE OFFICERS (casualty) (1 with additional duties in the Skin Department and 1 with additional duties in the E.N.T. Department), should be sent as soon as possible to the Group Secretary at the above address.

HACKNEY HOSPITAL, London, E.9. (General—844 Beds.) Applications from registered medical practitioners for the 6 months appointment of HOUSE PHYSICIAN, now vacant, should reach the Group Secretary at the above address by 31st March, quoting reference HH/HP.

LONDON JEWISH HOSPITAL, Stepney Green, E.1. Applications invited for the post of RESIDENT HOUSE SURGEON, vacant 6th April, 1954. Tenable for 6 months, renewable. Salary £350, £400, or £450 p.a. according to experience, subject to deduction at the rate of £100 for board, lodging, &c. Available as pre-registration appointment.

Applications, with copies of testimonials, to the Secretary at the Hospital.

LONDON CHEST HOSPITAL. Hospitals for Diseases of THE CHEST. Applications are invited for the appointment of Part-time REGISTRAR (grading Senior Registrar). The duties require the equivalent of 5 notional half-days a week, including 1 Refill Clinic. The appointment is for 1 year renewable.

Applications, stating age, qualifications with dates, and previous appointments held and accompanied by copies of 3 testimonials, should reach the undersigned not later than 10th April. THOMAS BROWN, House Governor.

London Chest Hospital, E.2.

LONDON CHEST HOSPITAL. Hospitals for Diseases OF THE CHEST. A vacancy occurs 1st May, 1954, for RESIDENT SURGICAL OFFICER. Appointment for 6 months with prospect of renewal. Post graded as Senior House Officer or Registrar according to qualifications and experience. Previous surgical experience necessary.

Applications, stating age, qualifications with dates, and previous appointments held, should reach the undersigned not later than 30th March, 1954.

THOMAS BROWN, House Governor.

London Chest Hospital, E.2.

LONDON HOSPITAL, Whitechapel, E.1. Applications are invited for the post of REGISTRAR to the Department of Psychiatry. A higher qualification although desirable is not essential.

Applications (12 copies), giving the names and addresses of 3 referees, should be received by the House Governor by 31st March, 1954. H. BRIERLEY, House Governor.

KING'S COLLEGE HOSPITAL, Denmark-hill, S.E.5. Applications are invited for the appointment of SENIOR RESIDENT MEDICAL OFFICER at the Belgrave Hospital for Children, S.W.9, to start as soon as possible. The appointment is for 1 year in the first instance and will be in the grade of Registrar.

Applications, stating age, education, qualifications and experience, with the names of 2 referees, should reach the undersigned by 1st April, 1954. S. W. BARNES, House Governor.

MARIE CURIE HOSPITAL, 66, Fitzjohn's-avenue, Hampstead, N.W.3. Applications are invited from registered medical practitioners for the post of GYNÆCOLOGICAL HOUSE SURGEON (radiotherapy), vacant 12th April, 1954.

Applications with copies of testimonials to the Medical Director.

MIDDLESEX HOSPITAL, W.1. Applications invited for the post of CASUALTY REGISTRAR, vacant 1st June. Appointment until 31st December, renewable.

Application forms, obtainable from Deputy Superintendent, should be submitted, naming 3 referees, by 8th April.

MIDDLESEX HOSPITAL, W.1. Applications invited from candidates reading for the D.M.R.D. for the post of SENIOR HOUSE OFFICER in the Department of X-ray Diagnosis.

Forms of application obtainable from the Deputy Superintendent and should be submitted, naming 3 referees, by 8th April.

MIDDLESEX HOSPITAL, W.1. Required, Senior House OFFICER in the Department of Physical Medicine and Rheumatism on 1st June.

Application forms, obtainable from Deputy Superintendent, should be submitted, naming 3 referees, by 8th April.

NATIONAL HEART HOSPITAL, Westmoreland-street, W.1 (with which is associated the Institute of Cardiology). The Board of Governors invites applications to fill a vacancy in the post of REGISTRAR as from 1st June, 1954. Applicants should have been fully trained in general medicine and should possess a higher medical qualification. Opportunities for research are available.

Applications, with copies of 3 recent testimonials, should be sent to me not later than Saturday, 10th April, 1954.

ROBERT G. E. WHITNEY, Secretary to the Board.

NEASDEN HOSPITAL, Brentfield-road, N.W.10. (Infectious Diseases.) NORTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. Whole-time RESIDENT MEDICAL OFFICER (Registrar) required for 1 year in first instance. Experience in infectious diseases and children's diseases desirable but not essential. Post vacant late April. Hospital may be visited by direct appointment.

Application forms obtainable from and returnable to Group Secretary, Central Middlesex Group Hospital Management Committee, Acton-lane, N.W.10, by 31st March, 1954.

NEW CROSS GENERAL HOSPITAL, Avonley-road, S.E.14. BERMONDSEY AND SOUTHWARK GROUP HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the post of SENIOR HOUSE OFFICER, vacancy 1st April, for duties in connection with outpatients clinics and wards (medical and surgical) under the care of the Consultant staff of Guy's Hospital.

Applications, with names of 2 referees, to Group Secretary.

PUTNEY HOSPITAL, Lower Common, S.W.15. Casualty OFFICER AND E.N.T. HOUSE SURGEON (non-resident), House Officer grade, vacant immediately.

Apply at once, Hospital Secretary (L), enclosing copies of 3 recent testimonials.

QUEEN ELIZABETH HOSPITAL FOR CHILDREN MANAGEMENT COMMITTEE, Hackney-road, London, E.2, Shadwell, E.1, and BANSTEAD WOOD, SURREY. Applications are invited for the appointment of RESIDENT MEDICAL OFFICER (Male or Female) at Shadwell, E.1 (Senior House Officer grade), to become vacant on 1st June, 1954. Candidates must have had experience in the treatment of sick children. The appointment will be for 1 year.

Application forms may be obtained from the Secretary at Hackney-road, and should be returned, with not more than 3 testimonials, not later than 29th March, 1954.

SOUTH LONDON HOSPITAL FOR WOMEN AND CHILDREN, Clapham Common, S.W.4. Applications are invited from Women medical practitioners for the appointment of CLINICAL ASSISTANT to the Psychiatric Department at the above Hospital, vacant on 15th April, 1954. Experience in psycho-therapy work essential. The post is graded as General Practitioner and is for 2 sessions per week.

Form of application from the Group Secretary, Lambeth Group Hospital Management Committee, Renfrew-road, S.E.11, to be returned not later than 2nd April, 1954.

STEPNEY GROUP HOSPITAL MANAGEMENT COM-MITTEE. HOUSE PHYSICIANS (pre- or post-registration).

Mile End Hospital, vacant 3rd May.

St. George-in-the-East Hospital, vacant 28th April.

Application forms obtainable from Physician-Superintendent, Mile End Hospital, Bancroft-road, E.1, and Medical Superintendent, St. George-in-the-East Hospital, Raine-street, E.1.

ST. GEORGE'S HOSPITAL, S.W.1. Applications are invited for the post of Part-time FIRST ASSISTANT (9 half-days per week), in the grade of Senior Registrar, to the Department of Neurology. The successful candidate will be required to take up his duties as soon as possible after 1st July, 1954. The appointment will be for 1 year in the first instance.

Applications, giving details of age, education, qualifications, experience, and the names of 2 referees, should be received by the undersigned not later than 10th April, 1954.

P. H. CONSTABLE, House Governor.

ST. MARY'S HOSPITAL FOR WOMEN AND CHILDREN, Upper-road, Plaistow, London, E.13. Applications are invited for the post of RESIDENT SENIOR HOUSE OFFICER (general medicine) for a period of 12 months commencing in April, 1954.

Apply to the Group Secretary, West Ham Group Hospital Management Committee, Stratford, London, E.15, naming 3 referees, by 27th March, 1954.

ST. NICHOLAS HOSPITAL, Plumstead, London, S.E.18. CASUALTY OFFICER (recognised for F.R.C.S.), vacant early April. 6 months appointment. Salary £450 p.a., less £100 p.a. for residence.

Apply to Group Secretary, Memorial Hospital, Woolwich, S.E.18.

ST. NICHOLAS HOSPITAL, Tewson-road, Plumstead, S.E.18. HOUSE SURGEON (recognised for F.R.C.S.), vacant 17th April. Approved for Pre-registration Service.

Apply to Group Secretary, Memorial Hospital, Woolwich, S.E.18.

THE HOSPITAL FOR SICK CHILDREN, Great Ormond-street, London, W.C.1. There is a vacancy for a Part-time NON-RESIDENT SENIOR REGISTRAR to the Orthopædic Department (5½ sessions per week).

Full particulars and form of application, which must be returned not later than Monday, 5th April, 1954, are obtainable from the undersigned.

H. F. RUTHERFORD, House Governor and Secretary.

TOTTENHAM GROUP HOSPITAL MANAGEMENT COMMITTEE, N.15. RESIDENT OBSTETRIC HOUSE OFFICERS (third post) required at the Stoke Newington, N.16, and Hampton Court Units of the Bearsted Memorial Hospital (Jewish Maternity Hospital) :—

(*a*) Locum appointments. Stoke Newington Unit : 2nd–19th April and 1st May–30th June, 1954. Hampton Court Unit : 17th–30th June, 1954.

(*b*) 6-month appointments. Stoke Newington and Hampton Court Units : 2 vacancies, 1st July–31st December, 1954.

Previous obstetric experience an advantage. Posts recognised for the D.Obst.R.C.O.G. Applicants can be considered for appointment under (*a*) and (*b*).

Application forms from the Secretary, Tottenham Group Hospital Management Committee, The Green, N.15, which should be returned immediately.

WHIPPS CROSS HOSPITAL, E.11. Leytonstone (No. 10) HOSPITAL GROUP. Applications are invited for the post of SENIOR HOUSE OFFICER (Casualty Officer) at above Hospital.

Application forms may be obtained from the Hospital Secretary, Whipps Cross Hospital, Whipps Cross-road, London, E.11, to be returned by 31st March, 1954.

WHITTINGTON HOSPITAL, N.19. Registrar (whole-time) required for Obstetrical and Gynæcological Department (140 Beds). Post recognised for M.R.C.O.G. in Obstetrics and Gynæcology. Hospital may be visited by direct appointment.

Application forms obtainable from and returnable to Secretary, Archway Group Hospital Management Committee, 46, Cholmeley-park, N.6, within 10 days.

WOOLWICH GROUP HOSPITAL MANAGEMENT COMMITTEE. Locum RESIDENT SURGICAL OFFICER. From 5th April for 3 months. Salary £16 weekly.

Apply to Group Secretary, Memorial Hospital, Woolwich, S.E.18.

BEXHILL HOSPITAL, Bexhill, Sussex. (62 Beds.) 2 HOUSE SURGEONS. Posts now vacant. A small modern hospital on the South Coast, considerable acute surgical work and busy Outpatient Department, excellent all-round experience. National scale of salary.

Apply to Hospital Administrator.

ABERYSTWYTH. GENERAL HOSPITAL. (Hospital recognised for F.R.C.S. examination.) MID-WALES HOSPITAL MANAGEMENT COMMITTEE. Applications are invited from newly qualified medical practitioners seeking pre-registration posts under the Medical Act, 1950, for the resident post of HOUSE SURGEON at the above Hospital. Busy General Hospital. Salary on national scale less deduction for board and lodging.

Applications, with 2 testimonials, to the Group Secretary, Mid-Wales Hospital Management Committee, General Hospital, Aberystwyth, immediately.

ABERYSTWYTH. GENERAL HOSPITAL. (Hospital is recognised for F.R.C.S. examination.) MID-WALES HOSPITAL MANAGEMENT COMMITTEE. Applications are invited from registered medical practitioners for the resident post of SENIOR HOUSE OFFICER at the above Hospital.

Full particulars, stating age, qualifications, and experience, should be addressed to—

J. PRICE THOMAS, Secretary,
Mid-Wales Hospital Management Committee.
General Hospital, Aberystwyth.

ACCRINGTON. VICTORIA HOSPITAL. (112 acute beds.) Applications are invited for the resident post of SENIOR HOUSE OFFICER in Medicine which will fall vacant on 1st July, 1954. This post offers exceptional experience in a busy acute general hospital both on the wards and in the Outpatient Department to the medical officer who ultimately intends to set up in general practice.

Apply to the Secretary, Hospital Management Committee, Royal Infirmary, Blackburn.

ALTON, HAMPSHIRE. HENRY GAUVAIN HOSPITAL (formerly Morland Clinics). (120 Beds.) LORD MAYOR TRELOAR GROUP HOSPITAL MANAGEMENT COMMITTEE. SENIOR HOUSE OFFICER required for the above Hospital for period of 1 year from beginning of April. Salary £670 p.a. Non-pulmonary tuberculosis, orthopædic and general surgery. Married accommodation available in small cottage on estate at moderate charge. Primary or Final F.R.C.S. candidate preferred.

Apply as soon as possible to the Secretary, Lord Mayor Treloar Group Hospital Management Committee, Lord Mayor Treloar Orthopædic Hospital, Alton, Hants.

ASHFORD HOSPITAL, Ashford, Middlesex. North West METROPOLITAN REGIONAL HOSPITAL BOARD. RESIDENT REGISTRAR (Male) required at above Hospital, for Tuberculosis Unit of 56 Beds with some outpatient work. Post now vacant. Hospital may be visited by direct appointment with the Medical Director.

Application forms obtainable from, and returnable to, the Secretary, Staines Group Hospital Management Committee, Ashford Hospital, Ashford, Middlesex, by 31st March, 1954.

ASHFORD HOSPITAL, Ashford, Middlesex. North WEST METROPOLITAN REGIONAL HOSPITAL BOARD. RESIDENT ANÆSTHETIC REGISTRAR (Male) required at above Hospital (560 Beds with all the usual special departments) for general anæsthetic duties at Ashford and such other hospitals within the Group as may be necessary. Post vacant on 16th May, 1954. Hospital may be visited by direct appointment with the Medical Director.

Application forms obtainable from and returnable to the Secretary, Staines Group Hospital Management Committee, Ashford Hospital, Ashford, Middlesex, by 31st March.

AYLESBURY. ROYAL BUCKINGHAMSHIRE AND ASSOCIATED HOSPITALS MANAGEMENT COMMITTEE, AYLESBURY, BUCKS. Applications are invited for the following appointments:—

Stoke Mandeville Hospital

JUNIOR HOSPITAL MEDICAL OFFICER for National Spinal Injuries Centre. Neurological or surgical experience desirable.

Applications, with copies of 2 recent testimonials, to the Administrative Officer.

Tindal General Hospital

HOUSE SURGEON (Male or Female), pre-registration post, but registered practitioners invited to apply. The post offers wide experience of general surgery with operative practice, and is recognised for F.R.C.S. Vacant 1st April. The acute Surgical Unit consists of 95 Beds. No casualty department.

HOUSE SURGEON (E.N.T.), Male or Female, vacant now. New department with high turnover and 4 outpatient clinics weekly. Recognised for D.L.O. and F.R.C.S. No casualty department.

Please apply, with 2 testimonials, to the Administrative Officer as soon as possible.

St. John's Hospital (Psychiatric), Stone, near Aylesbury, Bucks

JUNIOR HOSPITAL MEDICAL OFFICER (resident or non-resident). Salary £700–£50–£1000 p.a., less a charge of £140 p.a. for board, lodging and laundry if resident. Accommodation for married man available if required.

Applications, stating age, qualifications, and experience, together with the names of 3 referees, to the Physician-Superintendent within 2 weeks of the appearance of this advertisement.

BIRMINGHAM. THE UNITED BIRMINGHAM HOS-PITALS. GENERAL HOSPITAL. Applications are invited for the post of CASUALTY SURGICAL REGISTRAR (resident), Registrar grade, for duty in the Casualty and Traumatic Department, with opportunities for experience in general surgery. The post is recognised by the Royal College of Surgeons for the purpose of the F.R.C.S. examination and is tenable for 1 year in the first instance. Candidates must be registered medical practitioners and have held a resident appointment in an approved hospital. Preference will be given to those holding a higher qualification.

Forms of application may be obtained from, and should be returned not later than 27th March, 1954, to, the Secretary, The United Birmingham Hospitals, Queen Elizabeth Hospital, Edgbaston, Birmingham, 15.

BIRMINGHAM. THE UNITED BIRMINGHAM HOSPITALS. QUEEN ELIZABETH HOSPITAL. HOUSE SURGEON to E.N.T. Department required for period ending 6th July, 1954. Recognised pre-registration post but registered medical practitioners may apply.

Forms of application may be obtained from the undersigned.

G. A. PHALP,
Secretary and Principal Administrative Officer,
United Birmingham Hospitals.

Queen Elizabeth Hospital, Birmingham, 15.

BIRMINGHAM. THE UNITED BIRMINGHAM HOSPITALS. THE CHILDREN'S HOSPITAL, Ladywood-road, BIRMINGHAM, 16. Applications are invited for the appointment of RESIDENT SENIOR HOUSE OFFICER (clinical pathology), vacant on 1st June, 1954, for 1 year. Applicants should have held resident appointments in a children's hospital or a children's department of a general hospital. The successful applicant will be required to work in the Clinical Pathological Department.

Forms of application may be obtained from the House Governor, and should be returned not later than 31st March, 1954. G. A. PHALP, Secretary to the Board of Governors.

BIRMINGHAM ACCIDENT HOSPITAL AND REHABILITATION CENTRE, Bath-row, BIRMINGHAM, 15. (215 Beds.) HOUSE SURGEONS (Male or Female). Posts vacant immediately, March and April. Recognised for F.R.C.S. The appointments will be for a period of 6 months, of which 2 may be spent in the Burns Unit (Medical Research Council). The Hospital is the largest Traumatic Unit in the country, and treats 50,000 new patients each year. Posts are open to registered practitioners and offer ample opportunity for practical experience in the management of all types of injury and teaching by the Consultant staff.

Applications, with copies of recent testimonials or names of 2 referees, to the Administrator.

BIRMINGHAM REGIONAL HOSPITAL BOARD.

1. **Herefordshire Group of hospitals, County Hospital, Hereford**

Whole-time REGISTRAR in General Surgery. Duties mainly at General (154 Beds—71 surgical beds including fracture and orthopædic) and County Hospitals, Hereford (310 Beds—40 surgical). Post recognised for F.R.C.S. Resident.

2. **Shrewsbury Group Hospital Management Committee, Royal Salop Infirmary, Shrewsbury**

(*a*) Whole-time REGISTRAR in Psychiatry required at Shelton Hospital, Shrewsbury (1039 Beds). Hospital recognised for D.P.M. Opportunities for outpatient clinic work. Single accommodation. General hospital experience an advantage.

(*b*) RESIDENT SURGICAL REGISTRAR. Duties mainly at Royal Salop Infirmary and Copthorne Hospital (170 surgical beds). Recognised for F.R.C.S. Possession of higher qualification an advantage.

3. **Stafford Hospital Management Committee, 13, Foregate-street, Stafford**

Whole-time REGISTRAR in Surgery. Resident. Duties mainly at Staffordshire General Infirmary (175 Beds) and Yarnfield Recovery Unit (32 Beds). Experience in surgery essential. Higher qualification desirable. Hospital recognised for F.R.C.S.

Application forms from Group Secretaries, to be returned before 15th April, 1954. Candidates may visit hospitals.

BIRMINGHAM. RUBERY HILL HOSPITAL. (950 Beds.) BIRMINGHAM NO. 6 GROUP (MENTAL B) HOSPITAL MANAGEMENT COMMITTEE. Applications invited for post of JUNIOR HOSPITAL MEDICAL OFFICER (Male or Female) resident or non-resident. Valuable experience provided in the diagnosis and treatment of all forms of neurosis and psychosis. Previous postgraduate psychiatric experience not essential. Ministry of Health terms and conditions of service.

Applications, stating name, age, nationality, qualifications, experience, and providing the names of 3 referees, to be sent as soon as possible to the Secretary, Offices of the Group Hospital Management Committtte, Rubery Hill Hospital, Birmingham.

BIRMINGHAM, 13. SORRENTO MATERNITY HOSPITAL. (112 Beds, including 24 premature baby cots.) OBSTETRIC HOUSE SURGEON. Appointment recognised for D.Obst.R.C.O.G. Hospital affiliated to Birmingham Medical School for training of students. Post vacant 1st May, 1954.

Applications to the Obstetrician, not later than 24th March, 1954.

BIRMINGHAM (SANATORIA) GROUP HOSPITAL MANAGEMENT COMMITTEE. YARDLEY GREEN HOSPITAL—THORACIC SURGICAL UNIT. Applications are invited for the posts of 2 SENIOR HOUSE OFFICERS. The appointments will give broad opportunities for experience in both tuberculous and non-tuberculous thoracic surgery.

Applications, stating age, qualifications, training and experience, together with copies of 3 recent testimonials, should be addressed to the Secretary, Yardley Green Hospital, Birmingham, 9.

BARNSTAPLE. NORTH DEVON INFIRMARY. (Central Group Hospital of 110 Beds.) SENIOR HOUSE OFFICER required, who will advise pre-registration staff in their work, and whose duties will include responsibility for special departments. Post tenable for 1 year in the first instance. Salary £670 p.a. Furnished flat available for family if required.

Applications, including the names of 3 referees, to Group Secretary, 19, Alexandra-road, Barnstaple.

BEDFORD GENERAL HOSPITAL. (439 Beds.) RESIDENT HOUSE SURGEONS required towards end of March (2 pre-registration (1 vacant immediately) and 1 post-registration). The appointments offer exceptional opportunity for general experience in a busy acute Surgical Unit.

Applications, stating age, nationality, qualifications, previous appointments, appointment for which applying, together with copies of 2 testimonials, should be forwarded to Group Secretary, Bedford Group Hospital Management Committee, 3, Kimbolton-road, Bedford, as soon as possible.

BENENDEN SANATORIUM, Benenden, near Cranbrook, KENT. Applications are invited from registered medical practitioners (Male or Female) for the resident post of SENIOR HOUSE OFFICER, for which there will be a vacancy at the end of March, 1954. Appointment for 6 months or 1 year. Salary £650 p.a. with free board and lodgings. The Sanatorium of 154 Beds is for the treatment of adult male and female cases of pulmonary tuberculosis, and is independent of the National Health Service. Superannuation scheme in operation.

Applications, stating age, qualifications, previous experience, with copies of testimonials, should be sent as soon as possible to the Secretary.

BISHOP'S STORTFORD, HERTFORDSHIRE. HAYMEADS HOSPITAL. (Midway between London and Cambridge. Main Line from Liverpool Street.) Applications are invited for the post of SENIOR HOUSE OFFICER (pathology) to commence 1st April, 1954, for 1 year. Salary £670, less £130 p.a. in respect of residential emoluments.

Applications, stating qualifications, nationality, age and experience, with copies of recent testimonials or the names of 2 referees, should be sent to the Hospital Secretary.

BISHOP'S STORTFORD, HERTFORDSHIRE. HAYMEADS HOSPITAL. (386 occupied beds. Midway between London and Cambridge. Main Line Railway from Liverpool Street.) Applications are invited from registered medical practitioners for the appointment of a Whole-time Temporary SURGICAL REGISTRAR at the above Hospital. Appointment to commence as soon as possible. Salary at the rate of £775–£890 p.a., less £130 p.a. for residential emoluments.

Applications, giving fullest details, together with copies of recent testimonials or the names of referees, to the Administrative Officer.

BISHOP'S STORTFORD AND DISTRICT HOSPITAL, Rye-street, BISHOP'S STORTFORD, HERTS. (67 Beds—medical, surgical, and maternity. Midway between London and Cambridge. Main Line Railway from Liverpool Street.) Applications are invited from registered medical practitioners for a RESIDENT HOUSE OFFICER (first or second post held). Salary £350–£400 p.a., less £100 p.a. residential emoluments. Appointment to commence as soon as possible.

Applications, stating age, nationality, qualifications, and experience, with copies of recent testimonials or the names of referees, should be sent to the Hospital Secretary, Haymeads Hospital, Bishop's Stortford, Herts.

BLACKPOOL. VICTORIA HOSPITAL. (344 Beds.) BLACKPOOL AND FYLDE HOSPITAL MANAGEMENT COMMITTEE. ASSISTANT RESIDENT SURGICAL OFFICER (Senior House Officer grade), vacant 6th May, 1954. Salary £670 p.a. Recognised for the F.R.C.S. Diploma. The post offers excellent experience in emergency and general surgery. Appointment for 12 months. The evening duties alternate with those of the Resident Surgical Officer.

Applications, with testimonials or the names of 2 referees, to be sent to the Hospital Secretary, Victoria Hospital, Blackpool.

BLACKPOOL. VICTORIA HOSPITAL. (344 Beds.) RESIDENT HOUSE OFFICER (gynæcology and obstetrics). Recognised for M.R.C.O.G. Post vacant 26th April, 1954. This is a busy general hospital with a large Outpatient Department and the post offers excellent opportunities for experience under Consultant Gynæcologists and Obstetricians.

Applications, with references, to the Hospital Secretary.

BOLTON DISTRICT GENERAL HOSPITAL. (604 Beds.) BOLTON AND DISTRICT HOSPITAL MANAGEMENT COMMITTEE. RESIDENT HOUSE PHYSICIAN for the Department of Pædiatrics. Not available to pre-registration candidates. Vacant 12th April, tenable for 6 months. Hospital recognised for D.C.H.

Applications, stating age, nationality, qualifications and experience and the names of 2 referees, should be sent immediately to H. P. TRAVIS, Group Secretary.

The Royal Infirmary, Bolton.

BOURNEMOUTH AND EAST DORSET HOSPITAL MANAGEMENT COMMITTEE. SOUTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. Applications are invited for the appointment of REGISTRAR in Orthopædic Surgery for the above Hospital Group consisting of 18 hospitals with 1548 beds. The orthopædic work is conducted mainly at the 2 major hospitals of the Group, viz., Royal Victoria Hospital, Bournemouth, and Poole General Hospital with 100 orthopædic beds and large Outpatient Departments covering both traumatic and non-traumatic orthopædics in all branches in children and adults.

Forms of application, obtainable from the Group Secretary, Hospital Management Committee Office, Royal Victoria Hospital, Gloucester-road, Bournemouth, should be returned to him, duly completed, within 14 days of the appearance of this advertisement.

BOURNEMOUTH. ROYAL VICTORIA HOSPITAL. BOURNEMOUTH AND EAST DORSET HOSPITAL MANAGEMENT COMMITTEE. SOUTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. Applications are invited for the appointment of REGISTRAR in Pathology (non-resident) at the above Hospital. Duties will be in all branches of pathology and there are full opportunities for wide experience. The post, which is recognised for the Diploma in Pathology, becomes vacant on 31st March, 1954, and is tenable for 1 year. Applicants may visit the laboratory by local arrangement.

Forms of application, obtainable from the Group Secretary, Hospital Management Committee Office, Royal Victoria Hospital, Gloucester-road, Boscombe, Bournemouth, should be returned to him duly completed, within 14 days of the appearance of this advertisement.

BRADFORD CHILDREN'S HOSPITAL. 2 House Officers (Female), 1 vacant now, 1 vacant 1st May. Recognised for D.C.H. Salary £350–£450 p.a., less £100 p.a. residential emoluments.

Applications, stating age, nationality, qualifications and experience, with copy testimonials to Secretary, Bradford Royal Infirmary.

BRADFORD ROYAL INFIRMARY.
HOUSE SURGEON (general and urology), vacant now. Recognised for F.R.C.S. and pre-registration purposes.
HOUSE OFFICER (anæsthetics), vacant 1st May. Recognised for D.A. and F.F.A.R.C.S. Opportunities for plastic and intra-thoracic experience.
Salary for either of above posts £350–£450 p.a., less £100 p.a. residential emoluments.
Applications, stating age, experience, qualifications, and nationality, with copy testimonials, to Secretary.

BRADFORD ROYAL INFIRMARY.
SENIOR ORTHOPÆDIC HOUSE SURGEON/CASUALTY OFFICER, vacant now.
ORTHOPÆDIC HOUSE SURGEON/CASUALTY OFFICER (Junior), vacant now. Recognised for pre-registration training.
Applications for either of above posts with copy testimonials to Secretary.

BRADFORD. ROYAL EYE AND EAR HOSPITAL. HOUSE SURGEON (ophthalmology), vacant 1st April. Recognised for D.O.M.S. and F.R.C.S. Salary £350–£450 p.a., less £100 p.a. residential emoluments.
Applications, stating age, nationality, qualifications, and experience, with copy testimonials, to Secretary, Bradford Royal Infirmary.

BRADFORD. ST. LUKE'S HOSPITAL. Senior House OFFICER (general medicine and clinical pathology), vacant 1st May. Salary £670 p.a., less £130 p.a. residential emoluments.
Applications, stating age, nationality, qualifications, and experience, with copy testimonials, to Secretary, Bradford Royal Infirmary.

BRADFORD. ST. LUKE'S HOSPITAL. House Officer (anæsthetics), vacant now. Recognised for D.A. and F.F.A. R.C.S. Opportunities for plastic and intrathoracic experience. Salary £350–£450 p.a., less £100 p.a. residential emoluments.
Applications, stating age, nationality, qualifications and experience, with copy testimonials, to Secretary, Bradford Royal Infirmary.

BLACKBURN. ROYAL INFIRMARY. (262 acute beds.) HOUSE SURGEON required. Post recognised F.R.C.S. and approved for pre-registration purposes.
Apply to Secretary, Hospital Management Committee Office, Royal Infirmary, Blackburn.

BRIGHTON AND LEWES HOSPITAL MANAGEMENT COMMITTEE GROUP HOSPITALS. SENIOR HOUSE OFFICER for duties in the E.N.T. Department (78 Beds) of the Group Hospitals. Vacant end of March. Recognised for F.R.C.S. and D.L.O.
Applications, with details of experience, &c., together with the names and addresses of 2 referees, to the Administrative Officer, Royal Sussex County Hospital, Brighton, 7.

BRIGHTON, 7. ROYAL SUSSEX COUNTY HOSPITAL. BRIGHTON AND LEWES HOSPITAL MANAGEMENT COMMITTEE. Locum REGISTRAR in General Surgery (resident) at the above Hospital. Salary £16 per week, less deductions at the rate of £150 p.a. for residence. Immediate vacancy, tenable to 30th September, 1954.
Applications, stating nationality, qualifications, previous posts held, together with the names of 2 referees, to the Secretary, Brighton and Lewes Hospital Management Committee, Brighton, 7.

BRIGHTON. SUSSEX EYE HOSPITAL. (56 Beds.) HOUSE SURGEON required at the above Hospital, vacant 1st April. Recognised for D.O. Successful applicant will be considered for senior post (Senior House Officer) on completion of 6 months.
Applications stating age, qualifications and experience, and naming 2 referees, to the Administrative Officer.

BRISTOL (near). WINFORD ORTHOPÆDIC HOSPITAL. (232 Beds.) SENIOR HOUSE OFFICER. Applications are invited from registered medical practitioners to fill a vacancy at end of March, 1954. Salary £670 p.a. Post tenable for 12 months or longer, resident or non-resident (Hospital bus service to and from Bristol).
Apply, stating age, qualifications and experience, with testimonials to undersigned, as soon as possible.
E. N. ROPER, Secretary.

BRISTOL. COSSHAM/FRENCHAY HOSPITAL MANAGEMENT COMMITTEE. SENIOR RESIDENT OFFICER AND CASUALTY OFFICER. Applications are invited for the above post at Cossham Memorial Hospital, Kingswood, Bristol, a general hospital of 89 Beds. Salary on the scale £700, rising to £1000 p.a., less an appropriate deduction for residential emoluments provided. The successful applicant will be appointed to the staff of the Cossham/Frenchay Hospital Group but the duties will be primarily at Cossham Hospital. The post is a residential one. Married quarters can be made available.
Applications, quoting age, experience and names of 2 referees, to the Group Secretary, Frenchay Hospital, Bristol, by 27th March.

BRISTOL. COSSHAM/FRENCHAY HOSPITAL MANAGEMENT COMMITTEE. FRENCHAY HOSPITAL. (519 staffed beds, expanding.) Applications are invited for the post of SENIOR HOUSE OFFICER in the regional Neurosurgery Department. This post offers useful surgical experience and the opportunity of gaining a working knowledge of neurological diagnosis.
Applications to the Secretary, Frenchay Hospital, quoting "N.S.F." Names of 2 referees required.

BRISTOL. SOUTHMEAD GENERAL HOSPITAL GROUP MANAGEMENT COMMITTEE. Required at Southmead Hospital (571 Beds including 133 maternity) RESIDENT SENIOR HOUSE OFFICER (medical). Post now vacant.
Applications, on forms to be obtained from the undersigned, to be returned not later than 23rd March, 1954.
C. C. HANCOCK, Group Secretary.
Southmead Hospital, Bristol.

BRISTOL. SOUTHMEAD GENERAL HOSPITAL GROUP MANAGEMENT COMMITTEE. Required at Southmead Hospital (571 Beds including 133 maternity) RESIDENT SENIOR HOUSE OFFICER (surgical) for 12 months commencing 1st June, 1954. Post recognised for F.R.C.S. examination.
Applications, on forms to be obtained from the undersigned, to be returned not later than 9th April, 1954.
C. C. HANCOCK, Group Secretary.
Southmead Hospital, Bristol.

BROMLEY GROUP HOSPITAL MANAGEMENT COMMITTEE. SENIOR HOUSE OFFICER in Anæsthetics for duty at Group hospitals, residing at Bromley Hospital, required 1st April, 1954, for 6 months (may be renewed). Recognised for D.A. Salary £670, less £150 residence.
Apply, naming 3 referees, to Administrative Officer, Bromley Hospital, Bromley, Kent.

BURY AND ROSSENDALE HOSPITAL MANAGEMENT COMMITTEE. BURY GENERAL HOSPITAL. SENIOR HOUSE OFFICER (surgical), resident or non-resident, at the above Hospital. Salary and conditions of service in accordance with national rules.
Applications should be made to—
H. WILKINSON, Esq., Group Secretary.
Bury General Hospital, Bury, Lancs.

CAERPHILLY HOSPITAL. (Married quarters. 144 Beds for general surgery, orthopædics, E.N.T., ophthalmology and gynæcology; 26 Beds for general medicine.) 2 SENIOR HOUSE OFFICERS and 1 HOUSE SURGEON (pre-registration if suitable candidate available) required. Hospital situated near Cardiff in pleasant surroundings.
Apply to Secretary, Hospital Management Committee, Caerphilly, near Cardiff.

CARSHALTON, SURREY. QUEEN MARY'S HOSPITAL FOR CHILDREN. (840 Beds.) HOUSE SURGEON (resident) required for 6 months, for general surgical duties and for duties in E.N.T. Department. Applicants must have completed 12 months Pre-registration Service.
Applications, stating age, qualifications, and experience, together with 3 recent testimonials, should be sent to the Group Secretary by 3rd April, 1954.

CARSHALTON, SURREY. QUEEN MARY'S HOSPITAL FOR CHILDREN. (840 Beds.) CLINICAL ASSISTANT required in E.N.T. Department for 3 half-days per week, at a salary of £175 per session, p.a.
Applications, stating age, qualifications, and experience, together with copies of 3 recent testimonials, should reach the Group Secretary by 3rd April, 1954.

CARSHALTON, SURREY. QUEEN MARY'S HOSPITAL FOR CHILDREN. (840 Beds.) Whole-time ANÆSTHETIC REGISTRAR. The surgical practice of the Hospital includes emergency, orthopædic, E.N.T. and general surgery, and there is a special Surgical Unit in association with the Hospital for Sick Children, Great Ormond-street. The post is very suitable for a lady or gentleman reading for the D.A. examination. Applicants invited to visit the Hospital (which is within easy reach of Central London) by appointment.
Applications, on forms obtainable from the Group Secretary, Queen Mary's Hospital for Children, Carshalton, Surrey, should be submitted by 3rd April, 1954.

CARSHALTON, SURREY. QUEEN MARY'S HOSPITAL FOR CHILDREN. (840 Beds.) Applications are invited for the post of HOUSE PHYSICIAN for general medical duties. Appointment subject to medical examination.
Applications, stating age, qualifications and experience, together with copies of 3 testimonials, should reach the Secretary by 3rd April, 1954.

COVENTRY GROUP 20 HOSPITAL MANAGEMENT COMMITTEE invite applications for the following posts:—
Gulson Hospital, Coventry (312 Beds)
HOUSE OFFICER in General Medicine, vacant 1st May. 77 medical beds.
HOUSE OFFICER in Pædiatrics, vacant 27th April. 52 pædiatric beds. Recognised for pre-registration and D.Ch.
George Eliot Hospital, Nuneaton (296 Beds)
HOUSE OFFICER in General Medicine, vacant 1st May. 50 medical beds. Recognised for pre-registration.
Manor Hospital, Nuneaton (139 Beds)
HOUSE OFFICER in General Medicine, vacant 6th May. 29 medical beds. Recognised for pre-registration.
Applications to the Secretary, No. 20 Group Hospital Management Committee, Stoney Stanton-road, Coventry.

CROYDON GROUP HOSPITAL MANAGEMENT COMMITTEE. SOUTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. REGISTRAR in Radiology (Diagnostic). Whole-time non-resident for Group. Candidates should have a Diploma in Radiology. Hospitals in Group may be visited by appointment with Radiologist.
Application forms obtainable from GEORGE A. PAINES, Group Secretary, Hospital Management Committee, General Hospital, Croydon, to be returned not later than 3rd April.

CANTERBURY. KENT AND CANTERBURY HOSPITAL. (276 Beds.) Applications are invited for the post of SENIOR HOUSE OFFICER (casualty) which becomes vacant early in April. Salary £670 p.a. Recognised for the F.R.C.S.
Applications to be sent to the Hospital Secretary at the above Hospital.

COLCHESTER. ST. MARY'S HOSPITAL, 14, Pope's-lane. Applications invited for post of SENIOR HOUSE OFFICER (medical) for duties at St. Mary's Hospital Geriatric Unit and at Essex County Hospital (general medical). Post tenable for 6 months or 1 year, resident or non-resident.
Applications, with copies of 3 testimonials, should be forwarded to the Group Secretary, Colchester Hospital Management Committee, 14, Pope's-lane, Colchester, Essex.

COLCHESTER GROUP HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the following posts :—

Black Notley Hospital, Braintree, Essex (544 Beds)

SENIOR HOUSE OFFICER to Pulmonary Tuberculosis Unit (198 Beds). Post tenable for 1 year.

HOUSE OFFICER (orthopædic surgery). First, second or third post, tenable for 6 months. Recognised for F.R.C.S. Salary as scale, plus £50.

HOUSE PHYSICIAN (medical and pædiatric wards). First, second, third or pre-registration post ; tenable for 6 months. Salary as scale, plus £50 p.a.

Locum REGISTRAR in Orthopædics. Salary £16 a week, less £150 a year if resident.

Locum REGISTRAR in Surgery. Salary £16 a week, less £150 a year if resident.

Applications, with copies of 3 testimonials, should be forwarded to the Group Secretary, 14, Pope's-lane, Colchester, Essex.

COLCHESTER GROUP HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the following posts, tenable for 6 months or 1 year :—

Essex County Hospital, Colchester (189 Beds)

SENIOR HOUSE OFFICER (Casualty and Radiotherapy Departments). Recognised for F.R.C.S.

SENIOR HOUSE OFFICER (Casualty and E.N.T. Departments). Recognised for F.R.C.S.

Applications, with copies of 3 testimonials, should be forwarded to the Group Secretary, 14, Pope's-lane, Colchester, Essex.

CHICHESTER (near). ALDINGBOURNE SANATORIUM (71 Beds) AND BOGNOR REGIS ANNEXE (49 Beds). HOUSE PHYSICIAN (Male or Female) required immediately for work in wards and Outpatient Clinics. Liaison with Thoracic Unit, Chichester. Resident at Bognor Regis.

Apply to Physician-Superintendent, Aldingbourne Sanatorium, near Chichester.

CARDIFF ISOLATION HOSPITAL. Cardiff Hospital MANAGEMENT COMMITTEE. SENIOR HOUSE OFFICER (resident) required at above Hospital.

Apply immediately to Group Secretary, 44, Cathedral-road, Cardiff.

CARDIFF (near). PRINCE OF WALES ORTHOPÆDIC HOSPITAL, RHYDLAFAR. CARDIFF HOSPITAL MANAGEMENT COMMITTEE. 2 SENIOR HOUSE OFFICERS required for above Hospital.

Form of application immediately from Group Secretary, Cardiff Hospital Management Committee, 44, Cathedral-road, Cardiff.

DARLINGTON MEMORIAL HOSPITAL. (210 Beds.) DARLINGTON DISTRICT HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the post of HOUSE SURGEON (resident), which post is recognised for the F.R.C.S. (Eng.). Salary in accordance with national scale.

Apply, giving age and references, to the undersigned forthwith.

G. W. BECKWITH, Group Secretary.

DEWSBURY HOSPITAL MANAGEMENT COMMITTEE NO. 11. Applications are invited for the position of SENIOR HOUSE OFFICER in Dermatology for work in the Dewsbury, Wakefield and Pontefract Groups, which will become vacant on 30th April, 1954. The position can be resident or non-resident as required. Salary and conditions of service are in accordance with national recommendations, and the post is subject to the National Health Service and Superannuation Acts.

Applications, giving full particulars of qualifications, experience, and previous posts, together with the names of 3 referees, should be addressed to the undersigned immediately.

GEO. W. BATCHELOR, Group Secretary.

20, Oxford-road, Dewsbury.

DEWSBURY. STAINCLIFFE GENERAL HOSPITAL. (314 Beds.) HOUSE OFFICER (general surgery), first, second, or third post, vacant 1st May, 1954, and tenable for 6 months. Recognised pre-registration appointment. The Hospital has a Surgical Unit of 66 Beds and is recognised for the F.R.C.S. Casualty duty is shared with 3 other House Officers.

Applications, with full particulars to the Administrative Officer at the Hospital.

DOUGLAS. NOBLE'S ISLE OF MAN HOSPITAL. (160 Beds.) Applications are invited for the post of RESIDENT ANÆSTHETIST at this busy Hospital, which has been approved for Pre-registration Service. The post, which becomes vacant at the end of March, 1954, offers varied experience in pleasant surroundings. 4 residents on the staff, salary at the rate of £350, £400, or £450 a year, according to experience. A deduction of £100 a year made in respect of residential emoluments. Duties may include acting in the medical wards or casualty. Appointment for 6 months in first instance.

Applications, stating full details, with copies of 2 recent testimonials, to the Secretary, Noble's Hospital, Douglas, Isle of Man.

DOUGLAS. NOBLE'S ISLE OF MAN HOSPITAL. (160 Beds.) Applications are invited for the post of HOUSE PHYSICIAN at this busy Hospital, which has been approved for Pre-registration Service. The post, which becomes vacant at 1st April, 1954, offers varied experience in pleasant surroundings. 4 residents on the staff. Salary £350, £400 or £450 a year, according to experience. A deduction of £100 a year made in respect of residential emoluments. The appointment is for 6 months in first instance.

Applications, stating full details, with copies of 2 recent testimonials, to the Secretary, Noble's Hospital, Douglas, Isle of Man.

DOVERCOURT. HARWICH AND DISTRICT HOSPITAL. (30 Beds.) Applications invited for post of SENIOR HOUSE OFFICER (Resident Surgical Officer). Post tenable for 1 year.

Applications, with copies of 3 testimonials, should be forwarded to the Group Secretary, Colchester Hospital Management Committee, 14, Pope's-lane, Colchester, Essex.

DAGENHAM HOSPITAL, Rainham-road South, Dagenham. There is a vacancy for the position of RESIDENT MEDICAL OFFICER (chest diseases), Junior Hospital Medical Officer status, at the above Hospital of 155 Beds, for pulmonary tuberculosis—all stages. Salary £700 (for an Officer appointed not less than 2 years after registration as a medical practitioner)–£50–£1000 p.a. Sound knowledge in general medicine and experience in modern treatment of tuberculosis essential. Further particulars available from the Physician-Superintendent.

Applications, stating age, qualifications and previous experience, together with recent testimonials, should be sent to the undersigned within 7 days of the appearance of this advertisement.

H. F. HARRIS, Deputy Group Secretary,
Ilford and Barking Group Hospital Management Committee.
King George's Hospital, Ilford.

DORKING GENERAL HOSPITAL, Horsham-road, DORKING. RESIDENT SENIOR HOUSE OFFICER (obstetrics and gynæcology) for 1-year appointment (renewable). Post recognised for D.Obst.R.C.O.G.

Apply Medical Superintendent.

DERBY. DERBYSHIRE ROYAL INFIRMARY. Senior HOUSE OFFICER (casualty) required 31st March, 1954. Recognised for F.R.C.S.

Applications, stating full details together with copies of 2 testimonials, to be sent to Secretary at the Infirmary.

EAST CUMBERLAND HOSPITAL MANAGEMENT COMMITTEE. Appointment of House Officers. Applications are invited for the following appointments :—

Cumberland Infirmary, Carlisle (340 Beds)

1 HOUSE OFFICER (" Specials "—E.N.T. and Eyes).

1 SENIOR HOUSE OFFICER (orthopædics).

Applications, with names of 2 referees, should be forwarded immediately to the Secretary, East Cumberland Hospital Management Committee, Cumberland Infirmary, Carlisle.

EDGWARE CHEST CLINIC AND EDGWARE GENERAL HOSPITAL. NORTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. Whole-time REGISTRAR in Diseases of the Chest required at above Clinic and Hospital, vacant 12th May, 1954. Adequate experience in general medicine essential. Experience in chest diseases and a higher qualification in medicine an advantage.

Application forms obtainable from and returnable to Group Secretary, Edgware General Hospital, Edgware, Middlesex, by 2nd April, 1954.

EDGWARE GENERAL HOSPITAL, Edgware, Middlesex. RESIDENT SENIOR ANÆSTHETIC HOUSE OFFICER required at above Hospital. Candidates should have held resident appointments in general hospitals and have had special experience in administering anæsthetics. Salary £670 p.a. Deduction of £130 p.a. for board, lodging, &c. Appointment for 6 months in first instance. Post vacant 13th April, 1954.

Applications, together with names of 2 referees, to Group Secretary, Edgware General Hospital, Edgware, Middlesex, by 3rd April, 1954.

EDINBURGH. ROYAL EDINBURGH HOSPITAL FOR MENTAL AND NERVOUS DISORDERS. HOUSE OFFICERS (Male or Female) are required at the above Hospital. Salary according to scale. Excellent opportunity for comprehensive training.

Applications to Physician-Superintendent, Morningside-place, Edinburgh.

EPPING. ST. MARGARET'S HOSPITAL. (485 Beds.) RESIDENT SENIOR HOUSE OFFICER (surgery) as Casualty Officer and Orthopædic House Surgeon. Immediate vacancy. Recognised training post for F.R.C.S. Busy general hospital with easy access to London. Salary on national scale less deduction for board, lodging, &c.

Applications, with copies of 2 testimonials, to the Group Secretary, Epping Group Hospital Management Committee, St. Margaret's Hospital, Epping, Essex, immediately.

FARNBOROUGH HOSPITAL, Farnborough, Kent. (800 Beds.) HOUSE SURGEON required, for 6 months from 12th April, 1954. Recognised for the F.R.C.S. Preference given to pre-registration candidates. Salary according to experience.

Apply, stating age, qualifications with dates, and experience, and naming 3 referees, to the Administrative Officer by 26th March, 1954.

GRIFFITHSTOWN, MONMOUTHSHIRE. COUNTY HOSPITAL. 251 Beds. SENIOR HOUSE OFFICER in Obstetrics and Gynæcology required 1st April. Post recognised for D.Obst. R.C.O.G. Modern Maternity Unit of 32 Beds. Salary £670, less £130 board-residence.

Write, quoting 2 referees, to T. A. JONES, Group Secretary. 64, Cardiff-road, Newport.

GRIMSBY MATERNITY HOSPITAL. (51 Beds.) Grimsby HOSPITAL MANAGEMENT COMMITTEE. SENIOR OBSTETRIC HOUSE OFFICER (resident) required for above Hospital. Post vacant 5th April. Large proportion of abnormal cases treated.

Apply immediately, quoting 2 referees, to Secretary, 3, Queens-parade, Grimsby.

GRIMSBY GENERAL HOSPITAL. (226 Beds.) Grimsby HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the post of SENIOR HOUSE OFFICER for Orthopædic, Fracture and Accident Service. Previous surgical and orthopædic experience would be an advantage. Locum would be considered.

Applications should be sent immediately to the Hospital Secretary, Grimsby General Hospital.

HOUNSLOW GENERAL HOSPITAL. (81 Beds.) Applications are invited for the appointment of CASUALTY OFFICER (resident). Senior House Officer grade, post now vacant. Salary £670 p.a., less £140 for residence, &c.

Applications, stating age, qualifications, experience, with copies of 3 recent testimonials or names for reference, to Hospital Secretary, Hounslow Hospital, Staines-road, Hounslow, Middlesex.

FRODSHAM. LIVERPOOL HOSPITAL, Kingswood, FRODSHAM, CHESHIRE. (135 Beds.) Applications are invited from registered medical practitioners for the position of JUNIOR HOSPITAL MEDICAL OFFICER at the above Hospital, which is for the treatment of pulmonary tuberculosis. Salary £700–£50–£1000 p.a. less deduction for residence. Resident accommodation for a single person, or house if married.

Applications, stating age, qualifications and experience, together with the names of 2 or 3 referees, should be forwarded not later than 31st March, 1954, to—

Dr. G. S. ERWIN, Physician-Superintendent.

HALIFAX AREA HOSPITALS MANAGEMENT COM-MITTEE. JUNIOR HOSPITAL MEDICAL OFFICER in Anæsthetics required for duty at Halifax General Hospital (425 Beds) and Royal Halifax Infirmary (301 Beds). Residence at Halifax General Hospital. Post now vacant.

Applications to Group Secretary, Royal Halifax Infirmary, Halifax.

HALIFAX GENERAL HOSPITAL. (425 Beds.) House PHYSICIAN (general medicine) required. Post vacant 1st May. Approved pre-registration appointment.

Applications to Group Secretary, Royal Halifax Infirmary, Halifax.

HALIFAX. ROYAL HALIFAX INFIRMARY. (301 Beds.) HOUSE SURGEON (E.N.T. and ophthalmology) required. Post vacant 2nd May. Approved pre-registration appointment.

Applications to Group Secretary, Royal Halifax Infirmary, Halifax.

HALIFAX. ROYAL HALIFAX INFIRMARY. (301 Beds.) HOUSE PHYSICIAN (general medicine) required. Post vacant 2nd May. Approved pre-registration appointment.

Applications to Group Secretary, Royal Halifax Infirmary, Halifax.

HALIFAX. ROYAL HALIFAX INFIRMARY. (301 Beds.) SENIOR HOUSE OFFICER in General Surgery required. Post vacant 4th April. Salary £670 p.a., with deduction of £130 p.a. for residence, &c.

Applications to Group Secretary, Royal Halifax Infirmary, Halifax.

HALIFAX. ROYAL HALIFAX INFIRMARY. (301 Beds.) HOUSE SURGEON required. Post vacant 26th March. Approved pre-registration appointment.

Applications to Group Secretary, Royal Halifax Infirmary, Halifax.

HALIFAX. ROYAL HALIFAX INFIRMARY. (301 Beds.) SENIOR HOUSE OFFICER in Orthopædic Surgery required. Duties include work in the Casualty Department. Post recognised for F.R.C.S. Salary £670 p.a., with deduction of £130 p.a. for residence, &c.

Applications to Group Secretary, Royal Halifax Infirmary, Halifax.

HASTINGS. ROYAL EAST SUSSEX HOSPITAL (150 Beds), ST. HELEN'S HOSPITAL (491 Beds). HOUSE SURGEONS (resident) required, vacant now. Male or Female. 1 not pre-registration for Royal East Sussex Hospital. 1 pre-registration for St. Helen's Hospital. National scale of salary.

Apply to respective Hospital Administrator.

HITCHIN HOSPITALS, Hitchin, Hertfordshire. Applications are invited for the post of RESIDENT HOUSE SURGEON at the Lister Hospital, vacant 21st April, 1954. Recognised as a pre-registration post.

Applications, stating age, nationality, qualifications and experience, together with copies of 3 recent testimonials, to be sent to the Medical Director, Lister Hospital, Hitchin, Herts.

HORNCHURCH, ESSEX. ST. GEORGE'S HOSPITAL. JUNIOR HOSPITAL MEDICAL OFFICER (resident) required at this Hospital which accommodates 339 chronic sick patients. The post offers excellent geriatric experience.

Applications should be forwarded to the Secretary, Romford Group Hospital Management Committee, Oldchurch Hospital, Romford, as soon as possible.

INVERNESS HOSPITALS BOARD OF MANAGEMENT. ROYAL NORTHERN INFIRMARY. HOUSE SURGEON (E.N.T. and Eyes) required for 6 months from 1st April, 1954. Post recognised for pre-registration.

Applications, with references, to Medical Superintendent.

INVERNESS HOSPITALS BOARD OF MANAGEMENT. ROYAL NORTHERN INFIRMARY. HOUSE SURGEON (general surgery) required from 20th April, 1954. Post recognised for pre-registration.

Applications, with references, to Medical Superintendent.

IPSWICH. EAST SUFFOLK AND IPSWICH HOS-PITAL. (360 Beds.) EAST ANGLIAN REGIONAL HOSPITAL BOARD. RADIOLOGICAL REGISTRAR. The department is the centre for consultant radiological services for the Ipswich Hospital Group. Appointment for 1 year, renewable for second year.

Detailed applications, including age and names of 3 referees, to Secretary of Board, 117, Chesterton-road, Cambridge, by 29th March, 1954. Candidates invited to visit Hospital by direct arrangement with Hospital Management Committee Secretary at the Hospital.

IPSWICH. EAST SUFFOLK AND IPSWICH HOS-PITAL. (360 Beds.) Applications are invited for the post of HOUSE SURGEON to the Fracture and Orthopædic Department. Approved pre-registration post.

Applications, with copies of recent testimonials, to the Hospital Secretary.

IPSWICH. EAST SUFFOLK AND IPSWICH HOSPITAL. (360 Beds.) Applications are invited for the post of SENIOR HOUSE OFFICER in General Medicine. The post offers a good opportunity for working for higher qualifications and there are approximately 70 acute medical beds.

Applications, stating age, nationality, together with copies of recent testimonials, should reach the Hospital Secretary by 3rd April, 1954.

IPSWICH. EAST SUFFOLK AND IPSWICH HOSPITAL. (360 Beds.) Applications are invited for the post of HOUSE SURGEON to the General Consulting Surgeon, vacant on 1st May, 1954. The post is recognised for pre-registration and for the F.R.C.S. examinations.

Applications, with copies of recent testimonials, to the Hospital Secretary.

ISLEWORTH. SOUTH MIDDLESEX HOSPITAL, Mogden-lane, ISLEWORTH, MIDDLESEX. NORTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. A REGISTRAR (whole-time), resident, required at above Hospital. Hospital admits all types of infectious diseases and offers wide clinical experience and opportunity for postgraduate studies. Post vacant now. Candidates may visit Hospital by direct appointment with the Physician-Superintendent.

Application forms obtainable from and returnable to the Group Secretary, South West Middlesex Hospital Management Committee, West Middlesex Hospital, Isleworth, by 30th March, 1954.

KIDDERMINSTER AND DISTRICT GENERAL HOS-PITAL. (112 Beds.) HOUSE SURGEON (not pre-registration) required at the above Hospital. Post fell vacant on 28th January, 1954.

Applications, with the names of 3 referees, to the Hospital Secretary.

LEAMINGTON SPA. WARNEFORD GENERAL HOS-PITAL. (207 Beds.) SOUTH WARWICKSHIRE HOSPITAL GROUP. Applications are invited (Male or Female) for the appointment of CASUALTY OFFICER (Senior House Officer), resident or non-resident. The post is vacant on 4th April, 1954, and is suitable for one reading for higher qualifications, offering facilities for contact with all Specialist Units in the Hospital.

Applications, with the names and addresses of 3 referees, to be sent to the Hospital Secretary.

LLANELLY HOSPITAL. (166 Beds.) Glantawe Hospital MANAGEMENT COMMITTEE. Applications are invited from registered medical practitioners for the 2 posts of JUNIOR HOSPITAL MEDICAL OFFICER (resident) for work in the Surgical Unit of 75 Beds. The posts offer excellent experience in general surgery.

Applications, stating age, experience and qualifications, to be addressed to the Hospital Secretary, Llanelly Hospital, Marble Hall-road, Llanelly.

LINCOLN. COUNTY HOSPITAL. (200 Beds. Recognised training hospital for F.R.C.S.) SHEFFIELD REGIONAL HOSPITAL BOARD. Whole-time RESIDENT SURGICAL REGISTRAR required. Appointment for 1 year in first instance.

Apply to Secretary, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield, by 29th March, 1954, giving age, nationality, qualifications, present and previous appointments with dates, naming 3 referees.

LINCOLN. COUNTY HOSPITAL. (200 Beds.) Applica-tions are invited for an approved Registration post in Surgery at the above Hospital.

Apply with full particulars to—

R. W. HOWICK, Group Secretary.

LEEDS, 9. ST. JAMES'S HOSPITAL. Leeds A Group HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the appointment of HOUSE SURGEON (plastic surgery), now vacant. The appointment is recognised as a pre-registration house post but applications will be accepted from practitioners registered before 1st January, 1953.

Applications, with copy of 1 testimonial and the names of 2 referees, should be forwarded to the Administrative Medical Officer, St. James's Hospital, Leeds, 9, as soon as possible.

LEEDS. UNITED LEEDS HOSPITALS. Applications are invited for the post of RESIDENT NEUROSURGICAL OFFICER at the General Infirmary at Leeds. The post, which is vacant at the present time, will be of Registrar or Senior House Officer status according to experience. The appointment will be for 1 year in the first instance.

Applications, giving details of qualifications and previous posts held, together with the names of 3 referees, are to be addressed not later than 25th March, 1954, to the Secretary to the Board, General Infirmary, Leeds, 1.

LEEDS. UNITED LEEDS HOSPITALS. Applications are invited for the following senior resident posts which will be vacant at the General Infirmary at Leeds from 1st May next. All 4 appointments are of Senior House Officer status and will be for a period of up to 1 year in each case.

RESIDENT ANÆSTHETIC OFFICER.
RESIDENT ORTHOPÆDIC OFFICER.
RESIDENT RADIO-SURGICAL OFFICER.
RESIDENT UROLOGICAL OFFICER.

Applications, giving full details of qualifications and previous posts held, together with the names of 3 referees, are to be addressed to the Secretary to the Board, General Infirmary, Leeds, 1, not later than 25th March, 1954.

LEEDS. UNITED LEEDS HOSPITALS. Applications are invited for 3 posts of SENIOR HOUSE OFFICER status which will be vacant on 1st May, 1954, in the Receiving-room of the General Infirmary at Leeds. The appointments will be for 6 months in the first instance. Residence in the Hospital is optional.

Applications, stating qualifications and previous posts held, together with the names of 3 referees, to be sent not later than 25th March, 1954, to the Secretary to the Board, General Infirmary, Leeds, 1.

LEEDS. UNITED LEEDS HOSPITALS. Applications are invited for the post of REGISTRAR to the Professorial Department of Paediatrics of this Teaching Hospital. The post will become vacant on 15th April next and will be for 1 year in the first instance.

Applications, giving full details of qualifications and previous posts with dates, together with the names of 3 referees, are to be forwarded to the Sub-Dean, School of Medicine, Leeds, 2, not later than 26th March, 1954.

LEEDS, 2. PUBLIC DISPENSARY AND HOSPITAL. LEEDS A GROUP HOSPITAL MANAGEMENT COMMITTEE. Applications are invited from registered medical practitioners for the appointment of CASUALTY OFFICER (Senior House Officer) at the above Dispensary. The appointment will be for a period of 1 year. Salary in accordance with the agreed terms and conditions of service of hospital medical and dental staffs, with an appropriate deduction in respect of board, lodging, &c.

Applications, stating age, qualifications, experience, &c., together with the names of 2 referees, to be forwarded to the undersigned as soon as possible.

J. FOLKARD, Secretary to the Committee.

Administrative Offices, St. James's Hospital, Leeds, 9.

LEEDS REGIONAL HOSPITAL BOARD AREA. Medical ACT, 1950. RESIDENT HOUSE OFFICER posts. Recognised pre-registration House posts will be available for the 6 months commencing 1st May, 1954, in the following hospitals approved under the Medical Act, 1950. Preference will be given to pre-registration candidates, but applications will also be accepted from practitioners registered before 1st January, 1953.

Scarborough Hospital (191 Beds)
1 General Surgical.
1 Surgical (general surgery, orthopædic and E.N.T.).

County Hospital, York (222 Beds)
2 Surgical (general surgery and gynæcology). (Recognised for F.R.C.S.)
1 Medical.

Hull Royal Infirmary and Sutton (242 Beds)
1 Surgical (general surgery and gynæcology). (Recognised for F.R.C.S.)

Kingston General Hospital, Hull (398 Beds)
1 Surgical (general surgery, gynæcology and orthopædic).

Victoria Children's Hospital, Hull (143 Beds)
(All posts recognised for D.C.H.)
1 General Surgical.
1 Surgical (general surgery and orthopædic).

Westwood Hospital, Beverley (202 Beds)
1 Surgical (orthopædic). (Recognised for F.R.C.S.)
1 Medical.

East Riding General, Driffield (249 Beds)
1 Medical.

Clayton Hospital, Wakefield (200 Beds)
1 Surgical (general surgery, orthopædic and gynæcology). (Recognised for F.R.C.S.)
1 Medical (general medical, pædiatric and ophthalmology).
1 Mixed (general medical, general surgery and dermatology).
1 Surgical (orthopædic, E.N.T. and general surgery). (Recognised for F.R.C.S.)

General Hospital, Wakefield (158 Beds)
1 Medical (general medical and pædiatric). (Recognised for D.C.H.)

Pinderfields General, Wakefield (663 Beds)
1 General Surgical.
1 Medical.
1 Medical (neurology).

General Hospital, Batley (99 Beds)
1 Surgical (orthopædic and ophthalmology).

General Hospital, Dewsbury (119 Beds)
1 Medical (general medical, pædiatric and dermatology).

Staincliffe General, Dewsbury (314 Beds)
1 Surgical (general surgery, orthopædic and E.N.T.).

Huddersfield Royal Infirmary (304 Beds)
1 General Surgical. (Recognised for F.R.C.S.)
1 Surgical (midwifery and gynæcology). (Recognised by R.C.O.G.)

Royal Halifax Infirmary (301 Beds)
1 Surgical (ophthalmology and E.N.T.).
2 Medical.

Halifax General Hospital (425 Beds)
1 Medical.
1 Midwifery. (Recognised by R.C.O.G.)

Bradford Royal Infirmary (507 Beds)
1 Surgical (general surgery and urology). (Recognised for F.R.C.S.)
1 Surgical (orthopædic and casualty). (Recognised for F.R.C.S.)
1 Medical.

St. Luke's Hospital, Bradford (828 Beds)
1 Medical.

Keighley Victoria Hospital (144 Beds)
1 Surgical (general surgery, orthopædic and E.N.T.). (Recognised for F.R.C.S.)

General Hospital, Otley (170 Beds)
1 Medical (general medical and pædiatric).

St. James's Hospital, Leeds (1539 Beds)
3 General Surgical. (Recognised for F.R.C.S.)
1 Surgical (gynæcology). (Recognised by R.C.O.G.)
7 Medical.
1 Medical (geriatric).
1 Medical (pædiatric).
1 Medical (dermatology).

Seacroft Hospital, Leeds (60 pædiatric beds)
2 Medical (pædiatric).

Harrogate and District General (249 Beds)
2 General Surgical. (Recognised for F.R.C.S.)

Candidates should express, where applicable, their preference for medical, surgical or midwifery posts within the same hospital on the application form.

Candidates wishing to apply for posts at more than 1 hospital should complete a separate form in respect of each hospital.

Application forms can be obtained from the Senior Administrative Medical Officer, Leeds Regional Hospital Board, Park-parade, Harrogate, or from the Dean, The School of Medicine, Thoresby-place, Leeds, 2, and should be returned to either of the above-named as soon as possible. Application may be made in advance of results of final examination.

LEEDS REGIONAL HOSPITAL BOARD invites applications for the following REGISTRAR posts :—

Anæsthetics

Hull A Group with additional duties at hospitals in the Hull B and East Riding Groups (non-resident).

Infectious Diseases

Duties at the Leeds Road Hospital, Bradford (120 I.D. beds) (resident).

Orthopædic Surgery

Duties at the Woodlands Orthopædic Hospital, Rawdon (100 Beds), and Orthopædic Outpatient Department, Bradford Royal Infirmary. Offers excellent training in all branches of accident and orthopædic surgery. May be non-resident.

Psychiatry

*(a) Oulton Hall Hospital, near Wakefield, and affiliated Mental Deficiency Colonies (aggregating 780 Beds) (non-resident).

*(b) Storthes Hall Hospital, Kirkburton, near Huddersfield (2680 Beds), and associated clinics. Accommodation available for a single person.

*(c) Research Registrar at Menston Hospital, near Leeds. The successful applicant will undertake work in connection with a Research project already commenced in conjunction with the University Department of Biochemistry and Psychiatry. This work will occupy approximately half of the Registrar's time at present and candidates will be invited to submit proposals for the remainder. Previous experience of psychiatry is essential.

*Facilities for attendance at the Leeds University will be provided if the successful candidates are studying for the D.P.M.

Applications, stating age, qualifications and details of present and previous appointments with dates, together with the names and addresses of 3 referees, should be forwarded to the Secretary, Joint Registrars Committee, Park-parade, Harrogate, not later than 26th March, 1954.

LIVERPOOL. THE UNITED LIVERPOOL HOSPITALS. Applications are invited for posts of SENIOR HOUSE OFFICER in Otorhinolaryngology at the Liverpool Ear, Nose and Throat Infirmary for the period to 30th September, 1954. The successful candidates will be eligible for reappointment for a further period from 1st October, 1954.

Apply as soon as possible on forms obtainable from the Secretary, The United Liverpool Hospitals, 80, Rodney-street, Liverpool, 1.

LUTON AND DUNSTABLE HOSPITAL, Luton, Beds. Applications are invited for the post of HOUSE PHYSICIAN. Recognised as pre-registration post. Vacant 5th April, 1954. The appointment will be for 6 months in the first instance.

Applications, stating age, nationality, qualifications and experience, together with copies of 3 recent testimonials, to be sent to the Secretary by 30th March, 1954.

LUTON AND DUNSTABLE HOSPITAL, Luton, Beds. Applications are invited for the post of RESIDENT ANÆSTHETIST (Senior House Officer), vacant 20th April, 1954. The post offers varied experience and is recognised for the D.A. examination.

Applications, stating age, nationality, qualifications and experience, together with copies of 3 recent testimonials, to be sent to the Secretary by 12th April, 1954.

LYMINGTON HOSPITAL, Lymington, Hampshire. (95 Beds.) RESIDENT SENIOR HOUSE OFFICER (medical) required from 1st May, 1954.

Applications, with copies of testimonials, to be submitted as soon as possible to the Group Secretary, Southampton Group Hospital Management Committee, Bullar-street, Southampton.

MAIDSTONE. MID-KENT HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the appointment of RESIDENT ANÆSTHETIST for joint duties at the Kent County Ophthalmic and Aural Hospital, and the West Kent General Hospital, Maidstone (total beds 248). The post, which is vacant now, is of Senior House Officer grade, and carries a salary of £670 a year, less £150 for residential emoluments. Excellent experience under Consultant Anæsthetists is available, and the post is recognised for the F.F.A.R.C.S. examination.

Applications, stating age, nationality, qualifications and experience, together with the names of 2 suitable referees, should be forwarded to the Administrative Officer, Kent County Ophthalmic and Aural Hospital, Maidstone.

MAIDSTONE. WEST KENT GENERAL HOSPITAL. (135 Beds.) MID-KENT HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the appointment of RECEIVING-ROOM OFFICER. Post vacant immediately. Salary £670 a year, with deduction of £150 a year for residential emoluments.

Applications to Administrative Officer at Hospital as soon as possible.

MANCHESTER, 19. THE DUCHESS OF YORK HOS-PITAL FOR BABIES. MANCHESTER BABIES' AND CHILDREN'S HOSPITAL MANAGEMENT COMMITTEE. Required, HOUSE PHYSICIAN (Male or Female) for 6 months. The Hospital is associated with Manchester University for teaching purposes.

Applications, with copies of 3 testimonials, to be sent to the Administrative Officer of the Hospital as soon as possible.

MANCHESTER REGIONAL HOSPITAL BOARD. BIRCH HILL HOSPITAL. OBSTETRIC AND GYNÆCOLOGICAL REGISTRAR (resident) post now vacant. Post recognised for 6 months of D.Obst.R.C.O.G. examination. Tenable for 1 year in the first instance.

Apply at once to Group Secretary, Central Offices, Birch Hill Hospital, Rochdale.

MANCHESTER REGIONAL HOSPITAL BOARD. Applications are invited for the whole-time post of ORTHOPÆDIC REGISTRAR in the Ashton, Hyde and Glossop Group of hospitals, with duties mainly at Ashton-under-Lyne General Hospital. There are 50 orthopædic beds and busy Orthopædic and Casualty Outpatient Departments.

Application forms obtainable from, and returnable to, the Group Secretary, Ashton, Hyde and Glossop Hospital Management Committee, Astley-road, Stalybridge, Cheshire.

MANCHESTER REGIONAL HOSPITAL BOARD. Applications invited for the resident post of REGISTRAR in Obstetrics/Gynæcology with duties mainly at Queen's Park Hospital, Blackburn, a general hospital of 644 Beds of which 83 are allocated to this specialty under the control of 2 Consultant Obstetricians/Gynæcologists. Post recognised for F.R.C.O.G.

Application forms from the Secretary, Hospital Management Committee, Royal Infirmary, Blackburn.

MANCHESTER REGIONAL HOSPITAL BOARD. Applications invited for the resident post of REGISTRAR in General Surgery at the Royal Infirmary, Blackburn, an acute general hospital of 262 Beds of which over 100 are allocated to general surgery under the control of 3 Consultant surgeons. Posts recognised for F.R.C.S.

Application forms from the Secretary, Hospital Management Committee, Royal Infirmary, Blackburn.

MANCHESTER. UNITED MANCHESTER HOSPITALS. MANCHESTER ROYAL INFIRMARY, MANCHESTER, 13. REGISTRAR to the Department of Hæmatology, to commence as soon as possible. Whole-time appointment for 12 months, renewable. The post is mainly clinical in character, involving ward and general outpatient clinic duties. Higher qualifications would be an advantage but are not essential.

Applications to be made on forms obtainable from the undersigned and to be returned not later than 7th April, 1954.

G. H. TAYLOR, Secretary.

MANCHESTER. UNITED MANCHESTER HOSPITALS. MANCHESTER ROYAL INFIRMARY, MANCHESTER, 13. SENIOR MEDICAL REGISTRAR, to commence as soon as possible in the University Department of Cardiology and to transfer after a period of 18 months to 2 years to a General Medical Unit at the Manchester Royal Infirmary or at one of the Manchester Regional Hospitals. Whole-time non-resident post, tenable for 12 months, renewable. Applicants must possess higher qualifications.

Applications to be made on forms obtainable from the undersigned and to be returned not later than 7th April, 1954.

F. J. CABLE, Secretary to the Board of Governors.

MANCHESTER. UNITED MANCHESTER HOSPITALS. MANCHESTER ROYAL INFIRMARY, MANCHESTER, 13. REGISTRAR to the Department of Anæsthetics, to commence as soon as possible. Whole-time, non-resident post, tenable for 12 months, renewable. Applicants should preferably possess a higher qualification.

Applications to be made on forms obtainable from the undersigned and to be returned not later than 27th March, 1954.

G H TAYLOR, Secretary.

MANCHESTER. UNITED MANCHESTER HOSPITALS. MANCHESTER ROYAL INFIRMARY, MANCHESTER, 13. SENIOR HOUSE OFFICER to the Department of Hæmatology, to commence as soon as possible. Whole-time, non-resident post. Appointment for 6 months, renewable for a second and possibly a third 6 months. Salary £670 p.a.

Applications to be made on forms obtainable from the undersigned and to be returned not later than 27th March, 1954. G. H. TAYLOR, Secretary.

MANCHESTER. WEST MANCHESTER HOSPITAL MANAGEMENT COMMITTEE.

Park Hospital, Davyhulme (General Hospital—426 Beds)

1 SENIOR HOUSE OFFICER (anæsthetics). Hospital recognised for training for Diploma in Anæsthetics. Post now vacant.

1 SENIOR HOUSE OFFICER (pædiatrics). Hospital recognised for training for Diploma in Child Health. Vacant 1st May, 1954.

1 SENIOR HOUSE OFFICER (obstetrics and gynæcology). Post recognised for training for Membership and Diploma in Obstetrics examination of the R.C.O.G. Vacant 20th May, 1954.

2 HOUSE OFFICERS (general surgery) (pre- or post-registration). Posts recognised for F.R.C.S. examination. Posts now vacant.

1 HOUSE OFFICER (E.N.T.) (pre- or post-registration). Post now vacant.

Eccles and Patricroft Hospital

1 SENIOR HOUSE OFFICER, vacant mid-April, 1954.

1 HOUSE OFFICER (post-registration post). Additional allowance of £50 p.a. Post now vacant.

The work of the Hospital is mainly surgical and there is a busy Outpatient Department.

Forms from Secretary, Park Hospital, Davyhulme.

MARKET DRAYTON (near), SHROPSHIRE. CHESHIRE JOINT SANATORIUM. (305 Beds.) STOKE-ON-TRENT HOSPITAL MANAGEMENT COMMITTEE. RESIDENT MEDICAL OFFICER required (Junior Hospital Medical Officer or Senior House Officer according to experience). The post offers exceptional experience in the treatment of pulmonary tuberculosis.

Applications to the Medical Superintendent at the Sanatorium.

MORPETH (near). MONA TAYLOR MATERNITY HOSPITAL, STANNINGTON, near MORPETH, NORTHUMBERLAND. (25 Beds.) Applications are invited from registered medical practitioners for the appointment of RESIDENT SENIOR HOUSE OFFICER (obstetrics) at the above Hospital. Married men can apply for this post as an unfurnished semi-detached house is available at an approximate inclusive rental of £1 per week. Salary £670 p.a. gross.

Applications, stating age and full particulars of qualifications and experience, together with 2 testimonials (or the names of 2 referees), should be sent as early as possible to the Secretary, Wansbeck Hospital Management Committee, Thomas Knight Memorial Hospital, Blyth, Northumberland.

NORWICH. NORFOLK AND NORWICH HOSPITAL. (440 Beds.) Applications are invited for the appointment of SENIOR HOUSE OFFICER ANÆSTHETIST. Salary £670 p.a. If residential accommodation required, deduction £150 p.a.

Applications, stating age, qualifications, experience, with names for reference, to Secretary (Group 6), Hospital Management Committee, St. Stephen's-road, Norwich.

NORWICH. UNITED NORWICH HOSPITALS. East ANGLIAN REGIONAL HOSPITAL BOARD. ANÆSTHETIC REGISTRAR. Duties at Norfolk and Norwich Hospital, West Norwich Hospital, and Jenny Lind Children's Hospital. Post recognised for D.A. and provides wide experience. Single quarters available. Post now vacant.

Detailed applications, including age and names of 3 referees, to Secretary of Board, 117, Chesterton-road, Cambridge, by 5th April, 1954. Candidates invited to visit hospitals by direct arrangement with Hospital Management Committee Secretary at Norfolk and Norwich Hospital.

NEWCASTLE GENERAL HOSPITAL. Newcastle upon TYNE HOSPITAL MANAGEMENT COMMITTEE. DEPARTMENT OF OBSTETRICS. The resident post of OBSTETRICAL HOUSE SURGEON (70 Beds) becomes vacant on 1st May, 1954. This post is recognised for the purpose of Pre-registration Service, and preference will be given to provisionally registered persons who have served 6 months in a medical or surgical post since qualification. The department is recognised for the Diploma of M.R.C.O.G., and D.Obst.R.C.O.G., and undertakes the training of medical students in the University of Durham.

Applications should be addressed to the Secretary, Newcastle General Hospital, Westgate-road, Newcastle upon Tyne, 4, together with 1 copy of 2 recent testimonials by 15th April, 1954.

NEWMARKET GENERAL HOSPITAL, Newmarket, SUFFOLK. Applications are invited for the post of SENIOR HOUSE OFFICER (obstetrics (14 Beds), gynæcology (10 Beds)), with opportunity for gaining experience in general surgery. Post vacant on 22nd April, 1954. Salary £670 p.a., less emoluments.

Applications, giving age, nationality, and qualifications, together with copies of 3 recent testimonials, to be addressed to the Physician-Superintendent.

NEWMARKET GENERAL HOSPITAL, Newmarket, SUFFOLK. Applications are invited for the post of HOUSE SURGEON, which is immediately vacant. Duties include surgical house charge of general surgical, E.N.T., and eye cases. The post is resident and available for 6 months and is recognised for pre-registration.

Applications, with copies of 3 recent testimonials, should be addressed to the Physician-Superintendent.

NORTHAMPTON GENERAL HOSPITAL. (485 Beds.) Vacancies 1st April, 1954, for the following :—

4 HOUSE OFFICERS (general surgery).

FRACTURE AND ORTHOPÆDIC HOUSE OFFICER.

HOUSE OFFICER (Casualty Department) to work in conjunction with Senior House Officer—casualty.

All recognised for F.R.C.S. and for pre-registration.

SENIOR HOUSE OFFICER (Casualty Department) to work in conjunction with another Senior House Officer—casualty. Recognised for F.R.C.S.

SENIOR HOUSE OFFICER (E.N.T. Department). Recognised for F.R.C.S. and for D.L.O.

All 6-month appointments in first instance. Deduction £100 a year for residential emoluments.

Applications, enclosing copies of 3 testimonials, as soon as possible to S. G. HILL, Superintendent.

NORTH EAST METROPOLITAN REGIONAL HOSPITAL BOARD.

ANÆSTHETIC REGISTRAR (resident), Tilbury Riverside General Hospital, Essex. Post recognised for D.A.

Appointment subject to review after 1 year.

Separate applications in triplicate, detailing date of birth, qualifications, experience, present appointment, grade and salary, with 3 copies of 2 recent testimonials, to Secretary, 11A, Portland-place, W.1, by 3rd April, 1954.

NOTTINGHAM AND MIDLAND EYE INFIRMARY. Required, SENIOR HOUSE OFFICER for the above Hospital. Duties to commence on or about 23rd April, 1954. Salary £670 p.a., less a deduction of £150 for residential emoluments. Salary and conditions of service in accordance with Ministry regulations.

Applications, stating age, qualifications and experience, together with testimonials, to be sent to—

HENRY M. STANLEY, Group Secretary.

General Hospital, Nottingham.

NOTTINGHAM CHILDREN'S HOSPITAL. (136 Beds. Recognised for the D.C.H.) Applications are invited for the following posts which fall vacant at the beginning of May. The posts are tenable for 6 months or a year by agreement :—

RESIDENT HOUSE SURGEON (post recognised for pre-registration).

RESIDENT SENIOR HOUSE OFFICER (surgical).

Applications, with copies of 2 testimonials, should be sent to the Secretary, Nottingham Children's Hospital, Chestnut-grove, Nottingham.

NOTTINGHAM GENERAL HOSPITAL. Resident HOUSE SURGEON required (Male or Female, also open to pre-registration candidates) at the above Hospital ; duties to commence as soon as possible. Salary and conditions of service in accordance with published regulations. The appointment is for a term of 6 months.

Applications, stating age, qualifications, and experience, to be sent to HENRY M. STANLEY, Group Secretary.

NOTTINGHAM GENERAL HOSPITAL. Hogarth RadioTHERAPY CENTRE. A vacancy exists at the above Centre for a SENIOR HOUSE OFFICER in Radiotherapy or REGISTRAR (if in possession of part I D.M.R.T.) in Radiotherapy. The Centre is recognised as a Training School for both Part I and II D.M.R.(T.) (Royal College of London) in conjunction with the University of Nottingham, and instruction for this examination can be given to those interested and suitable. The position offers excellent experience for persons studying for other postgraduate degrees.

Apply as soon as possible, stating age, qualifications and experience, together with names of 3 referees, to the Group Secretary, General Hospital, Nottingham.

NOTTINGHAM GENERAL HOSPITAL. Applications are invited from registered medical practitioners for the post of SENIOR ORTHOPÆDIC AND FRACTURE HOUSE OFFICER (resident or non-resident by arrangement). The post offers exceptional experience in traumatic and orthopædic surgery. Duties to commence as soon as possible. Salary and conditions of service in accordance with Ministry regulations. If resident £150 deducted for emoluments. Locum considered.

Applications, stating age, qualifications, and experience, together with copies of testimonials, to be sent to—
HENRY M. STANLEY, Group Secretary.

NOTTINGHAM. HIGHBURY HOSPITAL. Senior HOUSE OFFICER required (resident). The successful candidate will, in addition to medical duties, have an opportunity of assisting in the Obstetric Unit. Terms and conditions of service as laid down by the Ministry of Health. This post will be accepted as a general medical appointment for entry to the M.R.C.O.G. examination.

Apply in writing, stating age, qualifications and experience, together with copies of testimonials, to the undersigned as soon as possible. HENRY M. STANLEY, Secretary.

NOTTINGHAM. HIGHBURY HOSPITAL, Bulwell. Applications are invited from fully qualified medical practitioners for the post of SENIOR HOUSE OFFICER in the Obstetrical and Gynæcological Department (48 obstetrical beds, 11 gynæcological beds and a small block for puerperal pyrexia). The appointment is for a period of 12 months commencing about mid-May. The Hospital is recognised for the M.R.C.O.G. (obstetrics only). Salary and conditions of service in accordance with the Ministry regulations.

Applications, stating age, qualifications and experience also nationality, with copies of 3 recent testimonials, to be sent to—
General Hospital, Nottingham. HENRY M. STANLEY.

OXFORD. UNITED OXFORD HOSPITALS. Applications invited for the post of SENIOR HOUSE PHYSICIAN (non-resident) to the Nuffield Department of Medicine at the Radcliffe Infirmary, Oxford, with effect from 1st May, 1954, for 6 months.

Applications, stating age, qualifications and experience, together with names of 2 referees, to Administrator, Radcliffe Infirmary, Oxford, by 29th March, 1954.

OXFORD. UNITED OXFORD HOSPITALS. Applications invited for post of HOUSE SURGEON to Accident Service, Radcliffe Infirmary (45 Beds), for 6 months with effect from 1st May, 1954. Duties include 2 months head injuries, 2 months Male and 2 months Female and Children's wards, in addition to Casualty Department.

Apply, stating age, qualifications and experience, together with names of 2 referees, to Administrator, Radcliffe Infirmary, Oxford, by 29th March, 1954.

PETERBOROUGH. THE MEMORIAL HOSPITAL, AND OBSTETRIC ANNEXES. PETERBOROUGH AND STAMFORD HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the position of HOUSE SURGEON (obstetrics and gynæcology). There are 54 obstetric beds and a busy Gynæcological Department. The Unit consists of a Consultant, Registrar, and 2 House Surgeons. House Surgeon posts are recognised for D.Obst.R.C.O.G. Vacant 16th May, 1954.

Apply Secretary, Memorial Hospital, Peterborough.

PLYMOUTH. SOUTH DEVON AND EAST CORNWALL HOSPITAL. Applications are invited from registered medical practitioners for the appointments of :—

(1) HOUSE SURGEON in Obstetrics and Gynæcology, 14th May, 1954, recognised for the Membership of the Royal College of Obstetricians and Gynæcologists. Wide experience can be obtained in obstetrics, including antenatal and postnatal clinics.

(2) SENIOR HOUSE OFFICER in Surgery, Freedom Fields, March, 1954. The Hospital is recognised for the Fellowship of the Royal College of Surgeons.

(3) HOUSE SURGEONS, Greenbank Road, immediately and 20th April, 1954, recognised for the Fellowship of the Royal College of Surgeons.

(4) HOUSE SURGEON, Devonport, 18th May, 1954.

Applications, stating age, nationality, qualifications and experience, with names of 3 referees, to be sent to—
ARTHUR R. CASH, Group Secretary.
7, Nelson-gardens, Stoke, Plymouth.

PONTEFRACT. GENERAL INFIRMARY. Pontefract AND CASTLEFORD HOSPITAL MANAGEMENT COMMITTEE (YORKS). RESIDENT SURGICAL OFFICER required. Graded Senior House Officer. Salary £670. 1-year appointment. Recognised for Fellowship. Offers good scope for practical experience. Vacant. Married accommodation available if required.

Applications to Secretary, Gt. Northern House, Salter-row, Pontefract, Yorks.

PONTYPOOL AND DISTRICT HOSPITAL Pontypool, MONMOUTHSHIRE. (115 Beds.) JUNIOR HOSPITAL MEDICAL OFFICER (surgical) required immediately. This is the senior resident post, and resident staff consists of 2 House Surgeons, a House Physician and this post. This is a busy acute general hospital with a good Outpatient Department and regular visits from Consultants. Post offers good practical experience in surgery. Salary £700–£50–£1000, less £150 board-residence.

Write, quoting names of 2 referees, to—
T. A. JONES, Group Secretary.
64, Cardiff-road, Newport, Mon.

PORTSMOUTH GROUP HOSPITAL MANAGEMENT COMMITTEE. SOUTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. Applications are invited for the post of RESIDENT SURGICAL OFFICER (Registrar grade) with duties mainly at the Royal Portsmouth Hospital.

Forms of application may be obtained from the Group Secretary, 35, Grove-road South, Southsea, which should be returned to him, duly completed, on or before 2nd April, 1954. Canvassing will disqualify. Candidates may visit the above Hospital by arrangement with the Group Secretary.

PORTSMOUTH GROUP HOSPITAL MANAGEMENT COMMITTEE. SOUTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. Applications are invited for the post of ANÆSTHETIC REGISTRAR in the Portsmouth Group, main duties at the Royal Portsmouth Hospital. 5 Consultant Anæsthetists practise in the Group.

Forms of application may be obtained from the Group Secretary, Portsmouth Group Hospital Management Committee, 35, Grove-road South, Southsea, which should be returned to him, duly completed, on or before 2nd April, 1954. Canvassing will disqualify. Candidates may visit the above Hospital by arrangement with the Secretary of the Group.

PORTSMOUTH GROUP HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the following appointments :—

Saint Mary's Hospital
SENIOR HOUSE PHYSICIAN, vacant now. The duties will be mainly in medical wards that form an Admission Unit for 450 geriatric beds in the Group, a Consultant Physician being in charge of this Unit. In addition, the successful candidate will act as Registrar to 20 acute medical beds in the Hospital.

Royal Portsmouth Hospital
SENIOR HOUSE SURGEON (Orthopædic and Casualty Departments), vacant now.

Queen Alexandra Hospital
(124 surgical beds) Recognised for F.R.C.S.
SENIOR HOUSE SURGEON, vacant now.
HOUSE SURGEONS, 2 posts vacant now. Pre-registration posts.

Infectious Diseases Hospital (310 Beds—Fever and T.B.)
SENIOR HOUSE OFFICER, vacant now.

Applications, stating age, experience, and qualifications, and names of 2 referees, should be submitted as soon as possible to—
35, Grove-road South, Southsea. E. H. HURST.

PORTSMOUTH GROUP HOSPITAL MANAGEMENT COMMITTEE. MATERNITY AND GYNÆCOLOGICAL DEPARTMENT OF THE PORTSMOUTH GROUP OF HOSPITALS. HOUSE SURGEON required. Main duties at Queen Alexandra Hospital (39 gynæcological beds). Post recognised for the purpose of D.Obst.R.C.O.G. and M.R.C.O.G.

Applications, stating age, experience and qualifications, together with the names of 2 referees, should be submitted as soon as possible to E. H. HURST.
35, Grove-road South, Southsea.

PORTSMOUTH. ST. JAMES HOSPITAL FOR MENTAL AND NERVOUS DISEASE. GROUP 49 HOSPITAL MANAGEMENT COMMITTEE. SOUTH WEST METROPOLITAN REGION. Applications are invited for the appointment of SENIOR PSYCHIATRIC REGISTRAR. The Hospital offers excellent experience in the diagnosis and treatment of all forms of mental illness and has separate departments for child psychiatry and neurology. Candidates should possess the D.P.M. and may visit the Hospital by appointment with the Physician-Superintendent.

Application forms may be obtained from the Group Secretary and should be returned to him duly completed within 3 weeks of the appearance of the advertisement.

REDHILL COUNTY HOSPITAL. Locum Registrar in Anæsthetics required for 3 weeks from 25th March. Salary £16 per week.

Apply to Group Secretary, Redhill County Hospital, Earlswood Common, Redhill, Surrey (Redhill 3581).

REDHILL. EAST SURREY HOSPITAL, Shrewsbury-road, REDHILL, SURREY. RESIDENT HOUSE SURGEON (pre-registration), vacant 19th April.

Applications to Hospital Secretary at above address.

ROCHESTER. ST. BARTHOLOMEW'S HOSPITAL. (Recognised for D.A.) MEDWAY AND GRAVESEND HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for non-resident post of SENIOR HOUSE OFFICER in Anæsthetics for Group. The principal duties will be at above Hospital and post will be tenable for 1 year. Salary £670 p.a.

Applications, giving full particulars, to be addressed to Group Secretary, 20, Star-hill, Rochester.

ROMFORD, ESSEX. OLDCHURCH HOSPITAL. (722 Beds.) SENIOR HOUSE OFFICER (resident) required for duties in the Casualties and Admission Department. This is a large general hospital with specialised departments dealing with all types of acute medical and surgical cases. The post affords good opportunity for gaining tuition and experience.

Applications should be addressed to Group Secretary, Romford Group Hospital Management Committee, Oldchurch Hospital, Romford, as soon as possible.

ROMFORD, ESSEX. OLDCHURCH HOSPITAL. (722 Beds.) SENIOR HOUSE OFFICER in Pathology required in this large general hospital containing well-equipped laboratory where excellent opportunities exist for gaining extensive experience.

Applications to be sent to Group Secretary, Romford Group Hospital Management Committee, Oldchurch Hospital, Romford.

ROMFORD, ESSEX. OLDCHURCH HOSPITAL. (722 Beds.) HOUSE SURGEON (resident) required from 1st May, 1954, in the Obstetric and Gynecological Unit consisting of 96 obstetric beds and 52 gynæcological beds. Post is approved for pre-registration purposes and recognised for D.Obst.R.C.O.G. and M.R.C.O.G.

Apply to Group Secretary, Romford Group Hospital Management Committee, Oldchurch Hospital.

ROTHERHAM. MOORGATE GENERAL HOSPITAL. (358 Beds.) SHEFFIELD REGIONAL HOSPITAL BOARD. Whole-time RESIDENT REGISTRAR (anæsthetics) required. The Hospital is recognised for the D.A. and deals with most of the operative specialties. Appointment for 1 year in first instance.

Apply to Secretary, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield, by 29th March, 1954, giving age, nationality, qualifications, present and previous appointments with dates, naming 3 referees.

ROTHERHAM. MOORGATE GENERAL HOSPITAL. (358 Beds.) SHEFFIELD REGIONAL HOSPITAL BOARD. Whole-time RESIDENT SURGICAL REGISTRAR required. Appointment for 1 year in first instance.

Apply to Secretary, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield, by 29th March, 1954, giving age, nationality, qualifications, present and previous appointments with dates, naming 3 referees.

ROTHERHAM. OAKWOOD HALL SANATORIUM (100 Beds), AND THE CHEST CLINIC, ROTHERHAM. Whole-time RESIDENT REGISTRAR (chest diseases) required. Appointment for 1 year in first instance.

Apply to Secretary, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield, by 29th March, 1954, giving age, nationality, qualifications, present and previous appointments with dates, naming 3 referees.

SALISBURY GENERAL HOSPITAL. Salisbury Group HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the appointment of SENIOR HOUSE OFFICER to the E.N.T. Department. The Department is recognised for D.L.O. and F.R.C.S. Post vacant now.

Applications, naming 2 referees, to Group Secretary, Odstock Hospital, Salisbury, Wilts.

SALISBURY GENERAL HOSPITAL. Salisbury Group HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the post of RESIDENT or NON-RESIDENT CASUALTY OFFICER (Senior House Officer) for a period of 12 months. Post vacant now.

Applications, naming 2 referees, to Group Secretary, Odstock Hospital, Salisbury.

SHREWSBURY. ROYAL SALOP INFIRMARY. (241 Beds.) SHREWSBURY GROUP HOSPITAL MANAGEMENT COMMITTEE. Applications are invited from registered medical practitioners for the appointment of ORTHOPÆDIC/ACCIDENT HOUSE SURGEON (Senior House Officer). The successful applicant will be allowed to attend for 2 days a month at The Robert Jones and Agnes Hunt Orthopædic Hospital, Oswestry, for postgraduate study with the Consultant. Post recognised under revised Fellowship regulations in respect of 6 months training required for the Final Fellowship examination. Vacant 1st April, 1954.

Applications, stating age, qualifications, nationality and experience, accompanied by copy testimonials, should be sent to the Group Secretary, Royal Salop Infirmary, Shrewsbury.

SHREWSBURY. ROYAL SALOP INFIRMARY AND COPTHORNE HOSPITAL. (500 Beds.) SHREWSBURY GROUP HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the post of RESIDENT ANÆSTHETIST (Senior House Officer). Post recognised under conditions of F.F.A.R.C.S. examination. Vacant immediately.

Applications, stating age, nationality, qualifications and previous experience, together with copies of recent testimonials, should be sent to the Group Secretary, Royal Salop Infirmary, Shrewsbury.

SHEFFIELD. THE UNITED SHEFFIELD HOSPITALS. Applications are invited for the following non-resident posts of REGISTRAR grade.

(*a*) To the Department of Radiology. Candidates should hold a Diploma in Diagnostic Radiology. Post vacant 15th May.

(*b*) In E.N.T. Surgery, Royal Infirmary. Post vacant.

Applications, stating age, qualifications and experience, with the names of 3 referees, should be sent immediately to the Chief Administrative Officer, The United Sheffield Hospitals, West-street, Sheffield, 1.

SHEFFIELD. CITY GENERAL HOSPITAL. (642 Beds.) SHEFFIELD REGIONAL HOSPITAL BOARD. Whole-time RESIDENT or NON-RESIDENT CASUALTY REGISTRAR required. The successful candidate to reside at the Hospital when on duty (including "on call" duty). Appointment for 1 year in first instance.

Apply to Secretary, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield, by 29th March, 1954, giving age, nationality, qualifications, present and previous appointments with dates, naming 3 referees.

SHEFFIELD REGIONAL HOSPITAL BOARD. Locum NON-RESIDENT SENIOR REGISTRAR (radiology) required from 1st April at the Leicester Royal Infirmary for 1 month in the first instance. Remuneration at the rate of £22 per week.

Apply to Secretary, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield, naming 2 referees.

SHEFFIELD REGIONAL HOSPITAL BOARD. Locum RESIDENT SURGICAL REGISTRAR required immediately at the County Hospital, Lincoln. Remuneration at the rate of £16 per week with a deduction for residence.

Apply to Secretary, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield, naming 2 referees.

SHEFFIELD REGIONAL HOSPITAL BOARD. Whole-time SENIOR REGISTRARS in Psychiatry required for Bracebridge Heath Hospital, near Lincoln; The Pastures Hospital, Mickleover, near Derby; and The Towers Hospital, Humberstone, near Leicester. Posts non-resident at Bracebridge Heath Hospital and The Towers Hospital; a house available at the Pastures Hospital. Appointments for 1 year in the first instance, reviewable annually. Opportunity for research and experience in those special branches of psychiatry available in the Hospital area.

Application forms and details of posts obtainable from Senior Administrative Medical Officer, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield. Forms to be returned by 17th April, 1954.

SHEFFIELD REGIONAL HOSPITAL BOARD. Locum RESIDENT SURGICAL REGISTRAR required immediately at the Moorgate General Hospital, Rotherham. Remuneration at the rate of £16 per week with a deduction for residence.

Apply to Secretary, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield, naming 2 referees.

SHEFFIELD REGIONAL HOSPITAL BOARD. Locum RESIDENT MEDICAL REGISTRAR required from 24th March at the Royal Infirmary, Doncaster. Remuneration at the rate of £16 per week, with a deduction for residence.

Apply to Secretary, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield, naming 2 referees.

SCOTLAND. NORTHERN REGIONAL HOSPITAL BOARD. Applications are invited for the whole-time post of SENIOR REGISTRAR in Pædiatrics. The post is non-resident and the main duties are at Raigmore Hospital and the Royal Northern Infirmary, Inverness. Previous experience in pædiatrics is essential and experience in general medicine would be an advantage.

Forms of application and further particulars of the post are obtainable from the undersigned, to whom applications should be submitted by 5th April, 1954.

A. M. FRASER, M.D.,
Secretary and Administrative Medical Officer.
Office of the Northern Regional Hospital Board,
Raigmore, Inverness.

SCOTLAND. WESTERN REGIONAL HOSPITAL BOARD. Applications are invited for the following appointments which will be for 1 year in the first instance:—

REGISTRAR in Medicine based at the Western Infirmary.

REGISTRAR in Anæsthetics based at the Western Infirmary.

2 SENIOR REGISTRARS in Bacteriology, 1 based at Glasgow Royal Infirmary with duties at Belvidere Hospital, and the other based at Stobhill Hospital with duties at Ruchill Hospital.

SENIOR REGISTRAR in Ophthalmology at the Ophthalmic Institute of Glasgow Royal Infirmary.

These appointments are subject to the National Health Service (Scotland) superannuation regulations.

Applications (12 copies), stating date of birth, qualifications, experience, present appointment, and the names of 3 referees, to reach the Secretary, Western Regional Hospital Board, 64, West Regent-street, Glasgow, by 6th April, 1954.

SLOUGH. UPTON HOSPITAL. Locum Anæsthetic REGISTRAR required 1st April.

Applications, stating details of experience, to Hospital Secretary.

SLOUGH. UPTON HOSPITAL. Anæsthetic Registrar (resident) required at above Hospital. Post recognised for D.A. Approximately 60% of duties performed at Upton Hospital and 40% shared between other hospitals in the Group. Hospital may be visited by direct appointment.

Application form obtainable from and returnable to Group Secretary, Windsor Group Hospital Management Committee, Alma-road, Windsor, by 4th April.

SOUTHAMPTON. ROYAL SOUTH HANTS HOSPITAL. (278 Beds) AND SOUTHAMPTON GENERAL HOSPITAL (471 Beds). SENIOR HOUSE OFFICER (E.N.T.) required immediately. This post is recognised for the F.R.C.S. (Eng.) and D.L.O. examinations and provides experience in all branches of E.N.T. work, including audiometry. The Group includes a diagnostic and distributing hearing-aid centre.

Applications, with copies of recent testimonials, should be forwarded as soon as possible, to the Secretary, Southampton Group Hospital Management Committee, Bullar-street, Southampton.

SOUTHAMPTON. ROYAL SOUTH HANTS HOSPITAL. (278 Beds.) ORTHOPÆDIC HOUSE SURGEON required. Post recognised for Pre-registration Service and tenable for 6 months. This Hospital is the centre to which all trauma from a large industrial town and port is directed, thus providing excellent experience in the treatment of traumatic conditions; patients with orthopædic conditions are also drawn from a wide area.

Applications, with copies of testimonials, should be sent as soon as possible, to the Group Secretary, Southampton Group Hospital Management Committee, Bullar-street, Southampton.

SOUTHAMPTON. ROYAL SOUTH HANTS HOSPITAL. (278 Beds.) CASUALTY OFFICER SENIOR HOUSE OFFICER (orthopædic) required for the above Hospital (Orthopædic Unit 74 Beds). This Hospital is the centre to which all trauma from a large industrial town and port is directed, thus providing excellent experience in the treatment of traumatic conditions.

Applications, with copies of testimonials, to be submitted as soon as possible, to the Secretary, Southampton Group Hospital Management Committee, Bullar-street, Southampton.

SOUTHEND-ON-SEA. GENERAL HOSPITAL. Temporary CASUALTY OFFICER required (Registrar grade) for 2 or 3 weeks from 28th March. Duties chiefly in Casualty Department which is under the supervision of a Consultant in orthopædic surgery. Opportunities for work in fracture clinics in association with work of Orthopædic Department.

Applications, &c., to be sent to the undersigned as soon as possible. J. C. FIELD, Secretary.

STOKE-ON-TRENT. BUCKNALL ISOLATION HOSPITAL. STOKE-ON-TRENT HOSPITAL MANAGEMENT COMMITTEE. Applications invited for the post of SENIOR HOUSE OFFICER (medical) vacant shortly.

Applications, with copy testimonials and full details, to the Group Secretary, Hospital Management Committee, Princes-road, Stoke-on-Trent.

STOKE-ON-TRENT. CITY GENERAL HOSPITAL. (938 Beds.) STOKE-ON-TRENT HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the posts of SENIOR HOUSE OFFICER (surgical). 2 posts are available if no applicants are forthcoming for pre-registration appointments. The posts are recognised for F.R.C.S. examination.

Applications, giving details of previous appointments held together with copies of recent testimonials, should be forwarded forthwith to the Group Secretary, Hospital Management Committee, Princes-road, Stoke-on-Trent.

STOKE-ON-TRENT. CITY GENERAL HOSPITAL. (938 Beds.) STOKE-ON-TRENT HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the posts of HOUSE OFFICER (general surgery) pre-registration. 3 posts. Vacant shortly.

Applications, with copy testimonials, to be forwarded to the Group Secretary, Hospital Management Committee, Princes-road, Stoke-on-Trent.

STOKE-ON-TRENT. CITY GENERAL HOSPITAL. STOKE-ON-TRENT HOSPITAL MANAGEMENT COMMITTEE. HOUSE OFFICER (obstetrics and gynæcology) required. 2 posts vacant shortly. Pre-registration appointments. Recognised for M.R.C.O.G. and D.Obst.R.C.O.G.

Detailed applications to the Group Secretary, Hospital Management Committee, Princes-road, Stoke-on-Trent, with copy testimonials as soon as possible.

STOKE-ON-TRENT. NORTH STAFFORDSHIRE ROYAL INFIRMARY. STOKE-ON-TRENT HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the post of SENIOR HOUSE OFFICER (E.N.T.).

Apply, with copy testimonials, stating age, nationality, and full details of previous service, to the Group Secretary, Hospital Management Committee, Princes-road, Stoke-on-Trent.

STOKE-ON-TRENT. NORTH STAFFORDSHIRE ROYAL INFIRMARY. STOKE-ON-TRENT HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the pre-registration post of HOUSE OFFICER (gynæcology and obstetrics, mainly surgery). Recognised for M.R.C.O.G. (gynæcology).

Applications, giving full details, together with copy testimonials, to the Group Secretary, Hospital Management Committee, Princes-road, Stoke-on-Trent.

STOKE-ON-TRENT. NORTH STAFFORDSHIRE ROYAL INFIRMARY. (475 Beds.) STOKE-ON-TRENT HOSPITAL MANAGEMENT COMMITTEE. Applications invited for post of SENIOR HOUSE OFFICER (ophthalmics). Recognised for F.R.C.S. and D.O.

Applications, stating age, and experience, together with copy testimonials, to the Group Secretary at Head Office, Hospital Management Committee, Princes-road, Stoke-on-Trent.

STOKE-ON-TRENT. NORTH STAFFORDSHIRE ROYAL INFIRMARY. STOKE-ON-TRENT HOSPITAL MANAGEMENT COMMITTEE. Applications invited for HOUSE OFFICER (general surgery), vacant now. Hospital recognised for F.R.C.S. examinations, and the post is recognised for experience during the pre-registration period.

Apply, with copy testimonials, stating age, nationality, and full details of previous service, to the Group Secretary, Hospital Management Committee, Princes-road, Stoke-on-Trent.

SOUTHPORT AND DISTRICT HOSPITAL MANAGEMENT COMMITTEE.

Southport General Infirmary

SENIOR HOUSE OFFICER/SURGEON with casualty duties.

Southport Promenade Hospital

SENIOR HOUSE OFFICER/SURGEON. Duties include mainly orthopædic and E.N.T. work.

Above resident posts are tenable for 12 months and will be vacant in April. Salary £670 p.a., less £130 for board, &c.

Apply with 2 testimonials to—

T. CROOK, Group Secretary,
Southport and District Hospital Management Committee.
Promenade Hospital, Southport.

ST. ALBANS (near), HERTFORDSHIRE. SHENLEY HOSPITAL. (2232 Beds. 16 miles from London.) NORTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. Applications are invited for the post of SENIOR HOUSE OFFICER (psychiatric), resident or non-resident, for 1 year in the first instance, at above Hospital. Opportunity for work with neurotic as well as psychotic patients, and full facilities for D.P.M. training. The Hospital may be visited by appointment.

Applications to the Medical Superintendent.

ST. HELENS. ECCLESTON HALL HOSPITAL. (75 Beds.) ST. HELENS AND DISTRICT HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the post of SENIOR HOUSE OFFICER at the above Hospital. The person appointed will work under the supervision of the Consultant Chest Physician for the Group. There are 75 Beds and the work comprises all types of tuberculosis. Good residential accommodation for a single person, Male or Female, is available.

Applications to be forwarded to N. RICHARDS, Secretary.
Group Office, Whiston Hospital, Prescot.

ST. HELENS HOSPITAL. (196 Beds.) St. Helens and DISTRICT HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the appointment of RESIDENT HOUSE SURGEON (Senior House Officer grade).

Applications, stating age, qualifications and experience, and giving 2 names for reference, should be forwarded immediately to N. RICHARDS, Secretary.
Group Office, Whiston Hospital, Prescot.

SWANSEA HOSPITAL. (403 Beds.) Glantawe Hospital MANAGEMENT COMMITTEE. Registered medical practitioners are invited to apply for the resident appointment of SENIOR HOUSE OFFICER in the Gynæcological Department of the above Hospital.

Applications, stating age, qualifications and experience, should be addressed to the Group Secretary, Glantawe Hospital Management Committee, St. Helen's-road, Swansea.

SWANSEA. MOUNT PLEASANT HOSPITAL. Glantawe HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the post of SENIOR HOUSE OFFICER in Obstetrics for the new Maternity Unit of 44 Beds which will be opened shortly at the above Hospital.

Applications, stating age, qualifications and experience, should be addressed to the Group Secretary, Glantawe Hospital Management Committee, St. Helen's-road, Swansea.

SWANSEA. MOUNT PLEASANT HOSPITAL. Glantawe HOSPITAL MANAGEMENT COMMITTEE. Registered medical practitioners are invited to apply for the resident appointment of JUNIOR HOSPITAL MEDICAL OFFICER for work in the Medical and Surgical Departments, and in the Chronic Sick Wards of the above Hospital.

Applications, stating age, experience, and qualifications, should be addressed to the Group Secretary, Glantawe Hospital Management Committee, St. Helen's-road, Swansea.

SUTTON-IN-ASHFIELD. KING'S MILL HOSPITAL. (172 Beds.) SHEFFIELD REGIONAL HOSPITAL BOARD. Whole-time RESIDENT SURGICAL REGISTRAR required. Appointment for 1 year in first instance. Apart from the Surgical Unit there are also E.N.T. and Gynæcological Units at this Hospital.

Apply to Secretary, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield, by 29th March, 1954, giving age, nationality, qualifications, present and previous appointments with dates, naming 3 referees.

TAPLOW, near MAIDENHEAD. CANADIAN RED CROSS MEMORIAL HOSPITAL. HOUSE SURGEON to the Unit of Obstetrics and Gynæcology required. Post recognised for M.R.C.O.G. Preference given to candidates who have had previous experience in midwifery and gynæcology, and who are seeking a pre-registration House Officer post. Salary on national scale.

Applications, stating age, experience, and qualifications with dates, together with copies of 2 testimonials, should be forwarded to the Hospital Secretary by 26th March.

TAUNTON AND SOMERSET HOSPITAL. Applications are invited for the post of HOUSE SURGEON (casualty and E.N.T.). This is a pre-registration post and is recognised by the Royal College of Surgeons as a qualifying appointment for the Final Fellowship examination.

Applications, stating age, qualifications with dates, nationality, and details of experience, together with 2 recent testimonials, to be sent immediately to the Secretary, Taunton Hospital Management Committee, Musgrove Park Hospital, Taunton, Somerset.

TUNSTALL. BURSLEM, HAYWOOD AND TUNSTALL WAR MEMORIAL HOSPITAL. (96 Beds.) STOKE-ON-TRENT HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for SENIOR HOUSE OFFICER (surgical).

Apply, with copy testimonials and details of previous appointments held, to the Group Secretary, Stoke-on-Trent Hospital Management Committee, Princes-road, as soon as possible.

VENTNOR, ISLE OF WIGHT. ROYAL NATIONAL HOSPITAL FOR DISEASES OF THE CHEST. (249 Beds.) Required :—
JUNIOR HOSPITAL MEDICAL OFFICER, and
SENIOR HOUSE OFFICER.
Resident posts, unmarried. Hospital has all facilities for major thoracic surgery.

Applications, with names of 2 referees, to Physician-Superintendent.

WAKEFIELD. PINDERFIELDS GENERAL HOSPITAL. THORACIC UNIT. Applications invited for the following appointment in the Leeds Regional Thoracic Centre (54 Beds) at Pinderfields General Hospital :—
SENIOR HOUSE SURGEON, salary £670 p.a., less a charge of £130 p.a. for board, lodging, &c., or
Locum SENIOR HOUSE SURGEON, salary £13 per week, less a charge of £2 10s. a week for board, lodging, &c.

Address written applications, with full particulars and 2 names and addresses for reference, to—

W. E. EASTWOOD, Deputy Group Secretary,
Hospital Management Committee No. 10 Wakefield B Group.
Victoria Chambers, Wood-street, Wakefield.

WARRINGTON INFIRMARY. Warrington and District HOSPITAL MANAGEMENT COMMITTEE. Applications are invited from qualified practitioners for the vacancy of RESIDENT ANÆSTHETIST (Senior House Officer grade), Male or Female, at the Warrington Infirmary. Scale of salary £670 p.a., less £130 p.a. for residential emoluments.

Applications to—

H. L. BOOT, Group Secretary,
Warrington and District Hospital Management Committee.
c/o General Hospital, Warrington.

WELSH REGIONAL HOSPITAL BOARD.
REGISTRAR (general surgery), Royal Gwent Hospital, Newport. (Non-resident.)
REGISTRAR (general surgery), Port Talbot and District Hospital. (Resident or non-resident.)
REGISTRAR (obstetrics and gynæcology), Llwynypia Hospital, Rhondda. (Resident.)
Subject to review end of first year.

Application forms from Senior Administrative Medical Officer, Temple of Peace, Cathays Park, Cardiff, within 14 days.

WHITEHAVEN HOSPITAL, Cumberland. (109 Beds and Annexe of 19 Beds.) HOUSE OFFICER (obstetrical with surgical duties), House Officer or Senior House Officer grade. Vacant 1st May.

Detailed applications, with dates and copies of 2 testimonials, to Secretary.

WINDSOR. KING EDWARD VII HOSPITAL (Old WINDSOR UNIT), OLD WINDSOR, BERKS. RESIDENT PÆDIATRIC REGISTRAR required at above Hospital. Possession of D.C.H. desirable. Hospital may be visited by direct appointment.

Application forms obtainable from and returnable to the Secretary, Windsor Group Hospital Management Committee, Alma-road, Windsor, by 4th April.

WINCHESTER. ROYAL HAMPSHIRE COUNTY HOSPITAL. (311 Beds.) OBSTETRICS AND GYNÆCOLOGY HOUSE OFFICERS (2), both posts pre-registration, vacant 18th and 26th May respectively. The Hospital is recognised for D.Obst.R.C.O.G.

Applications, with copies of 2 testimonials, to the Secretary.

WINCHESTER. ROYAL HAMPSHIRE COUNTY HOSPITAL. (311 Beds.) SENIOR HOUSE OFFICER (orthopædics) required. Post recognised F.R.C.S. Wide experience available under area orthopædic team. Appointment for 6 months in first instance. Vacant early April.

Applications, with copies of 2 testimonials, to the Secretary.

WESTON-SUPER-MARE GENERAL HOSPITAL. (110 Beds.) Applications are invited from registered medical practitioners for the resident appointment of HOUSE SURGEON (non pre-registration). The appointment will be for a period of 6 months in the first instance and may be renewed for a further 6 months.

Applications, stating age, qualifications and experience, together with names and addresses of 2 referees, should be addressed to the Secretary, Weston-super-Mare Hospital Management Committee.

WOLVERHAMPTON. ROYAL HOSPITAL. Applications invited for RESIDENT SURGICAL REGISTRAR to this Hospital (310 Beds). Appointment starts 1st April for 1 year in first instance. Applicants should be F.R.C.S.

Apply, naming 3 referees, to Group Secretary, Royal Hospital, Wolverhampton, immediately.

WOLVERHAMPTON HOSPITAL MANAGEMENT COMMITTEE GROUP NO. 16 BIRMINGHAM REGION.

The Royal Hospital, Wolverhampton (an Associated Hospital of the University of Birmingham Medical School)

SENIOR HOUSE OFFICER or HOUSE OFFICER (Fracture and Orthopædic Department), vacant now.

HOUSE OFFICER (Ear, Throat and Nose Department), vacant now.

New Cross Hospital, Wolverhampton

HOUSE OFFICER (general surgery), vacant now.

Applications, with copies of 3 recent testimonials, to be sent to W. COCKBURN, Group Secretary.

The Royal Hospital, Wolverhampton.

WOLVERHAMPTON HOSPITAL MANAGEMENT COMMITTEE GROUP NO. 16 BIRMINGHAM REGION. Applications are invited for RESIDENT SURGICAL REGISTRAR for New Cross Hospital (636 Beds) with some duties at The Royal Hospital (310 Beds), preferably F.R.C.S. Appointment vacant now.

Apply, naming 3 referees, to Group Secretary, The Royal Hospital, Wolverhampton.

WORKINGTON INFIRMARY, Cumberland. (108 Beds. Pre-registration post.) HOUSE OFFICER (obstetrical and gynæcological). Grade according to experience. Vacant 1st May.

Detailed applications, with dates and copies of 2 testimonials, to Secretary.

WREXHAM. MAELOR GENERAL HOSPITAL. (513 Beds.) WREXHAM, POWYS AND MAWDDACH HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the post of HOUSE SURGEON at the above Hospital to commence immediately. The appointment is recognised for the Diploma of F.R.C.S. (Eng. and Edin.). Salary will be at the rate of £350, £400, or £450 p.a., according to experience, less £100 p.a. for full residential emoluments.

Applications, stating age, nationality, qualifications and experience, together with copies of 2 recent testimonials, should be addressed to—

WILLIAM JONES, Secretary, Wrexham,
Powys and Mawddach Hospital Management Committee.
Maelor General Hospital, Croesnewydd-road, Wrexham.

YORK A AND TADCASTER HOSPITAL MANAGEMENT COMMITTEE.

County Hospital, York (Acute Hospital of 269 Beds with full Consultant staff)

CASUALTY OFFICER (with charge of orthopædic beds), resident or non-resident (Junior Hospital Medical Officer grade) as soon as possible. Salary £700–£50–£1000, less £153 if resident. Recognised for F.R.C.S.

County Hospital, York, City Hospital, York (Acute Hospital of 265 Beds with full Consultant staff) **Yearsley Bridge Hospital** (Infectious Diseases Hospital of 86 Beds)

Required as soon as possible SENIOR HOUSE OFFICER in Pædiatrics and Infectious Diseases to spend approximately half-time in connection with pædiatric duties at the County Hospital (22 pædiatric beds), City Hospital (32 pædiatric beds) and other Hospitals in the Group, and approximately half-time at Yearsley Bridge Hospital. Candidates should have had previous experience of pædiatrics and infectious diseases. Preference given to holders of D.C.H. Salary £670 p.a., less £170 for residence at Yearsley Bridge Hospital.

Applications, giving age, nationality, experience, qualifications, and names of 2 referees, to the Secretary, York A and Tadcaster Hospital Management Committee, Bootham Park, York.

MULLINGAR, EIRE. COUNTY HOSPITAL. Westmeath COUNTY COUNCIL. Applications are invited from duly qualified medical practitioners for the position of HOUSE SURGEON in the County Hospital, Mullingar, at a salary of £6 per week inclusive of bonus with rations and apartments. The person to be appointed may be required to administer anæsthetics. The appointment will be for a period of 6 months ending 30th September, 1954.

Applications should be lodged with the Secretary, Westmeath County Council, County Buildings, Mullingar, not later than Friday, 26th March, 1954.

NEW YORK. NEW ROCHELLE HOSPITAL, New ROCHELLE, NEW YORK, U.S.A. (360-Bed general community hospital.) Approved by American College of Surgeons and American Medical Association for Internship and Residency Training. Only graduates from approved university schools accepted. Term of Internship: 1st July, 1954–30th June, 1955. INTERNES—$100 per month plus full maintenance. Return passage to England paid by Hospital after completion of internship.

Apply Superintendent.

YORKSHIRE. EAST RIDING HOSPITAL MANAGEMENT COMMITTEE.

Westwood Hospital, Beverley, Yorks (228 Beds)

(*a*) ORTHOPÆDIC HOUSE SURGEON (Senior House Officer), vacant now. Recognised for F.R.C.S.

(*b*) HOUSE SURGEON (first, second, or third post), vacant now. Pre-registration post. Recognised for F.R.C.S. General surgical duties, some orthopædics.

Broadgate (Mental) Hospital, Beverley, Yorks (650 Beds)

(*c*) HOUSE PHYSICIAN (first, second, or third post), vacant now.

East Riding General Hospital, Driffield, Yorks (247 Beds)

(*d*) HOUSE SURGEON (first, second or third post), vacant end April. Duties to include acute and chronic sick and casualties. Pre-registration post.

(*e*) HOUSE SURGEON (first, second or third post), vacant end April. Recognised for F.R.C.S. General surgical duties. Pre-registration post.

Salary for (*a*) is £670 p.a. and for (*b*), (*c*), (*d*) and (*e*) is £350–£450 p.a. Fully qualified practitioners may apply for the pre-registration posts.

Detailed applications to Secretary, Westwood Hospital, Beverley, Yorks.

Public Appointments

COLONIAL MEDICAL SERVICE. Vacancies occur from time to time in territories covered by the Colonial Medical Service for Medical Officers for general duties, including hospital and district work. These appointments offer great scope for the practice of many branches of medicine and surgery with a considerable measure of independence and personal responsibility. Appointments can usually be made on a permanent basis with pension (non-contributory) at age 50 or 55; on a temporary basis, with gratuity; or by appointment from the National Health Service for periods not exceeding 6 years, with continuation of National Health Service superannuation contributions and the payment of a resettlement grant of 20% of the aggregate of colonial salary on leaving the colony. Salaries of Medical Officers are varied: for example, £950–£1850 p.a. in Nigeria; £865–£1590 p.a. in Kenya (with a cost-of-living allowance in addition); and £1155–£2044 p.a. in Malaya (with a cost-of-living allowance in addition). Starting salaries depend on age and experience, and officers holding certain higher qualifications are granted 4 additional increments on the salary scale. There are many specialist and administrative posts yielding higher pensionable salaries than those quoted above to which Medical Officers would expect to be appointed on promotion in the course of a normal career. Free passages are granted. Income-tax is low. Tours of service vary from 10 months in parts of West Africa to 3 or 4 years in, for example, Kenya. Houses with heavy furniture are provided in most territories at a rental of about 10% of basic salary. Annual local leave is permissible and generous home leave is granted after each tour. Study leave on full pay is granted subject to the needs of the service to those who wish to acquire higher qualifications and so equip themselves for promotion to specialist posts. Officers serving in East and Central Africa often prefer to educate their children within that area, where schooling is available, or in South Africa. The short tours in West Africa enable frequent visits to be made to children being educated at home. Many officers have their children with them in West Africa until they reach school age.

Application forms can be obtained from the Director of Recruitment (Colonial Service), Colonial Office, Sanctuary Buildings, Great Smith-street, London, S.W.1 (quoting CDE.121/01).

LANCASHIRE COUNTY COUNCIL. Divisional Medical OFFICER, Health Division 11 (Leigh). Applicants must be medical practitioners holding the D.P.H. or equivalent qualification and with administrative experience. The Divisional Medical Officer will be required to act as Medical Officer of Health to the County Districts within the Division where they so desire. Basic salary as Divisional Medical Officer is £1300–£50–£1700. The present holder of the post has been appointed Medical Officer of Health to 5 County Districts which has increased the inclusive salary scale to £1725–£2125. The successful applicant would be allowed to hold similar appointments. Appointment is superannuable and subject to passing a medical examination.

Full particulars and application forms obtainable from the County Medical Officer, East Cliff County Offices, Preston, to be returned by 2nd April.

NORTHUMBERLAND. COUNTY OF NORTHUMBERLAND. National Health Service Act, 1946. Joint appointment of AREA EXECUTIVE MEDICAL OFFICER for the West Area and MEDICAL OFFICER OF HEALTH for the Urban District of Hexham and the Rural Districts of Bellingham, Haltwhistle, and Hexham. Applications are invited from registered medical practitioners for the joint appointment of Area Executive Medical Officer for the West Area and Medical Officer of Health for the Urban District of Hexham and the Rural Districts of Bellingham, Haltwhistle, and Hexham. The salary for the joint appointment will commence at £1487 10s. and rise by 3 annual increments of £56 5s. and 1 of £62 10s. to £1718 15s. plus a travelling allowance in respect of a motor-car not exceeding 12 h.p. The person appointed will be required to give his, or her, whole time to the duties of the joint appointment and must not engage directly or indirectly in private practice. The appointment is subject to the provisions of the Local Government Superannuation Act, 1937, to the national conditions of service and to 3 months notice in writing on either side, and the successful candidate will be required to pass a medical examination.

Application forms may be obtained from the Clerk of the County Council, County Hall, Newcastle upon Tyne, 1, to whom applications must be submitted not later than 31st March, 1954.

GLASGOW. CORPORATION OF GLASGOW. Applications are invited from registered medical practitioners for 2 appointments as Whole-time ASSISTANT MEDICAL OFFICERS in the School Health Service of the Health and Welfare Department. Experience in the treatment of children and/or possession of the Diploma in Public Health will be of advantage. Salary scale £950–£50–£1300. Posts are superannuable, subject to medical examination.

Applications, stating age, qualifications, and full details of training and experience, together with names of 3 referees, should be lodged with me (envelope marked "Appointment—Assistant Medical Officer, School Health Service") not later than 9th April, 1954. WILLIAM KERR, Town Clerk.

City Chambers, Glasgow, C.2.

MINISTRY OF LABOUR AND NATIONAL SERVICE. Registered medical practitioner required (preferably with industrial experience) for part-time appointment as CENTRE MEDICAL OFFICER at Government Training Centre, Buckingham-avenue, Slough. Duties include general medical supervision, including supervision of first-aid arrangements, &c., and (where required) examination of trainees. Attendance required up to 4 hours a week with a maximum of 2 sessions. Fees vary from £1 for session up to ½ hour to £2 15s. for maximum session of over 2½ but not exceeding 3 hours. Mileage allowance also payable in certain circumstances.

Write in duplicate, stating age, full details of qualifications and experience, with dates and periods of service (if any) with Forces, to E.C. Appointments Officer, Ministry of Labour and National Service, 1–6, Tavistock-square, W.C.1, by 31st March, 1954. No original testimonials should be sent.

MONTGOMERY. COUNTY OF MONTGOMERY. Mixed appointment of DISTRICT MEDICAL OFFICER AND ASSISTANT COUNTY MEDICAL OFFICER. Applications are invited from duly qualified and registered medical practitioners who possess a Diploma in Public Health, Sanitary Science or State Medicine for the following whole-time mixed appointment :—

A Medical Officer to act as an Assistant County Medical Officer of Health and as Medical Officer of Health respectively to the following districts :—

The Borough of Llanfyllin, the Borough of Montgomery, the Borough of Welshpool, the Forden Rural District and the Llanfyllin Rural District.

As Medical Officer of Health, the Officer will be responsible to each District Council in the combined area. As Assistant County Medical Officer of Health he will act under the general control and supervision of the County Medical Officer. His duties will be those prescribed by statute or regulation and will be such as are usually attached to such appointments. He should have had experience of School Health Services (including the examination of handicapped children) and of Child Welfare Services, and a Diploma in Child Health is desirable. The salary will be within the appropriate scales, i.e., between a minimum of £1368 15s. and a maximum of £1687 10s. p.a. A motor-car allowance will be paid in accordance with the scales recommended by the Whitley Councils for the Health Services (Great Britain). The appointment of Medical Officer of Health is subject to the provisions of Section 110 of the Local Government Act, 1933, and the Sanitary Officers (Outside London) Regulations, 1935, as amended by the Sanitary Officers (Outside London) Regulations, 1951. It is also subject to superannuation and the successful candidate will have to pass a medical examination.

Forms of application may be obtained from my office and applications, accompanied by 2 recent testimonials and the names of 2 other persons to whom direct reference can be made, must reach me not later than 8th May, 1954.

P. E. WHITE, Clerk of the County Council.

County Offices, Welshpool, 8th March, 1954.

NORTH WESTERN GAS BOARD. Applications are invited from registered medical practitioners for the pensionable appointment of MEDICAL OFFICER at a commencing salary of £1600 p.a. The Doctor appointed will be required to reside within reasonable distance of Bolton and to act as Industrial Medical Officer to the Board's Undertakings in the industrial belt around Manchester, for which a mobile Consulting-room will be available. Further details may be obtained on application.

Applications, giving the names of 3 referees, should reach the Secretary, North Western Gas Board, 60, Whitworth-street, Manchester, 1, within 14 days.

PRISON AND BORSTAL SERVICE. Psychiatric Social WORKERS (Women). Applications are invited for 2 posts in the above Service at Manchester and Wakefield. Salary £500–£20–£640 p.a. (National Health Service scale of Psychiatric Social Worker in sole charge). Starting pay according to qualifications and experience. Pensionable under the Health Services superannuation scheme. Consideration will be given to applicants able to work part-time only. Salary proportionate. Applicants must hold the Mental Health Certificate of either the University of Edinburgh, London, or Manchester, and should preferably be experienced in mental work.

Regulations and application forms from Establishment Officer (E.84/3/6.11), Prison Commission, Horseferry House, Dean Ryle-street, London, S.W.1, to be returned by 5th April, 1954.

WALSALL. COUNTY BOROUGH OF WALSALL. DEPUTY MEDICAL OFFICER OF HEALTH. Applications are invited from qualified medical practitioners for the above post at a salary of £1200 p.a., rising by annual increments of £50 to £1450 p.a. Applicants must possess the D.P.H. and should be approved in connection with the ascertainment of educationally subnormal children. Commencing salary according to qualifications and experience.

Applications to be sent to the undersigned not later than 31st March, 1954, from whom further particulars and application forms may be obtained. W. STALEY BROOKES, Town Clerk.

Council House, Walsall.

Miscellaneous

To non-professional posts the Notification of Vacancies Order 1952 applies

Applications are invited from British subjects aged 35–45 for the post of Chief Medical Officer of a large Corporation with Headquarter offices in London and extensive interests in the United Kingdom and overseas. Administrative ability to coöperate with the highest level of management essential. Salary according to qualifications and experience.—Applicants should write, giving full personal details to Box No. 7494, c/o CHARLES BARKER & SONS, LTD., 31, Budge-row, London, E.C.4.

Kuwait Oil Company Limited invites applications for the post of Medical Officer to act as Pathologist in the Company's hospital in Kuwait, where the laboratory is well equipped and facilities are good. In addition to qualifications registrable in U.K., candidates must have had charge of a Pathological Laboratory for at least 2 years. Some previous tropical service desirable. Age under 40. Salary according to experience but starting not less than £1500 p.a. clear, plus generous allowances, Pension Scheme and kit allowance.—Write for application form by 31st March, giving brief details and quoting K.1774 to Box D/30, c/o 191, Gresham House, E.C.2.

British Guiana Sugar Producers' Association have a vacancy for a Medical Officer on their Sugar Estates. Experience of tropical medicine an advantage but not a necessity. Minimum salary £1500 p.a., but more would be paid for good qualifications. Free quarters with basic furniture. Pension scheme. Travelling allowance. Initial engagement for 3 years, followed by 3 months leave in the United Kingdom with first-class passages paid both ways for employee, wife, and children up to 16 years.—Apply, in writing only, to BOOKERS SUGAR COMPANY LIMITED, 37/41, Gracechurch-street, E.C.3.

Pharmaceutical Manufacturers require technical executive to direct Product and Dosage forms of research and elaboration of manufacturing methods, up-to-pilot plant stage.—Applicants should state qualifications, experience, and salary required. Address, No. 912, THE LANCET Office, 7, Adam-street, Adelphi, London, W.C.2.

Industrial Medical Officer (part-time) required at Smethwick Factory of large organisation. Present duties occupy between 1–2 hours per week. Commencing fee £117 p.a. Local General Practitioner preferred.—Apply, Address, No. 910, THE LANCET Office, 7, Adam-street, Adelphi, London, W.C.2.

New Zealand lake-fishing resort, established country practice (£5000 gross) with large modern house and garden, expanding community. Reserve, house and goodwill £8500. Exchange about July.—R. WEST, Taupo, North Island.

A Surgeon-Practitioner is required for the Dickoya Districts, Ceylon. Applicants should have a Medical Degree and be Fellows of 1 of the Royal Colleges of Surgeons. Substantial retaining fee, free furnished bungalow, and extensive general practice. Modern Nursing-home, with all facilities, within 3 miles, good climate, elevation 4000 feet. Passage paid.—For further particulars apply to Hon. Secretary, DICKOYA DOCTOR SCHEME, New Valley, Norwood, Ceylon.

Surgeon wishes to contact any medical man who is interested in clinical research who perhaps for health or other reasons, is prevented from engaging in full-time medicine, and would consider part-time employment.—Address, No. 906, THE LANCET Office, 7, Adam-street, Adelphi, London, W.C.2.

Receptionist/Secretary, aged 27, desires post with doctor or dentist in Lincoln area to commence after Easter. Good qualifications. Would accept £300 p.a. to start.—Address, No. 909, THE LANCET Office, 7, Adam-street, Adelphi, London, W.C.2.

Devonshire-place, W.1. Consulting-room, newly decorated, size 18 ft. by 24 ft. with ante-room 9 ft. by 12 ft. available now. Parquet flooring throughout. £375 p.a. including receptionist. Suitable for a partnership.—Box No. C.A.S. 273, 25, Haymarket, S.W.1.

Well-known Nursing-home of high repute, standing in own grounds in good residential quarter, with open outlook, taking surgical, medical and maternity cases, for sale, in Midland Spa, owing to retirement of owner. Fully equipped theatre; 11 rooms (some double); all beds adjustable (Lawson Tait). Excellent staff accommodation. Consulting and waiting rooms. Oil-fired central heating. Aga stoves. Freehold.—For particulars apply to Secretary, Priors Nursing Home, 51, Lillington-road, Leamington Spa.

Oxford or Cambridge. Swiss M.D. seeks Professional family to receive his daughter, who wishes to study English, as paying guest, end of April for 6–9 months stay.—Terms to: Dr. LEUTENEGGER, Chur, Switzerland.

Microscopes. Highest prices paid for good modern types. Send or bring your equipment for valuation.—WALLACE HEATON LTD., 127, New Bond-street, W.1.

Applicants for posts requiring testimonials copied or duplicated should communicate with MANTON SECRETARIAL SERVICE, LTD., 98, Victoria-street, S.W.1 (Phone: VICtoria 0141), who are specialists in this kind of work.

"Pregnancy Diagnosis by the Xenopus Method," 24-hour service. Send specimen of urine and £1 1s. fee. Hæmatology, Biochemistry, Flame Photometry.—WELBECK BIOLOGICAL LABORATORIES, 26, Park-crescent, Portland-place, W.1 (MUSeum 5386–7).

Hypnotism. Will all Doctors interested in this subject for Medical purposes please write to the Secretary, British Society of Medical Hypnotists, 48, Wick Hall, Hove, 2, Sussex.

The Literary Repository and Catalogue of rare and scholarly books, a Quarterly for bookmen. No. 1 just published. 7½d. p.f.—STEVENS COX, Antiquarian Bookseller, Beaminster, Dorset.

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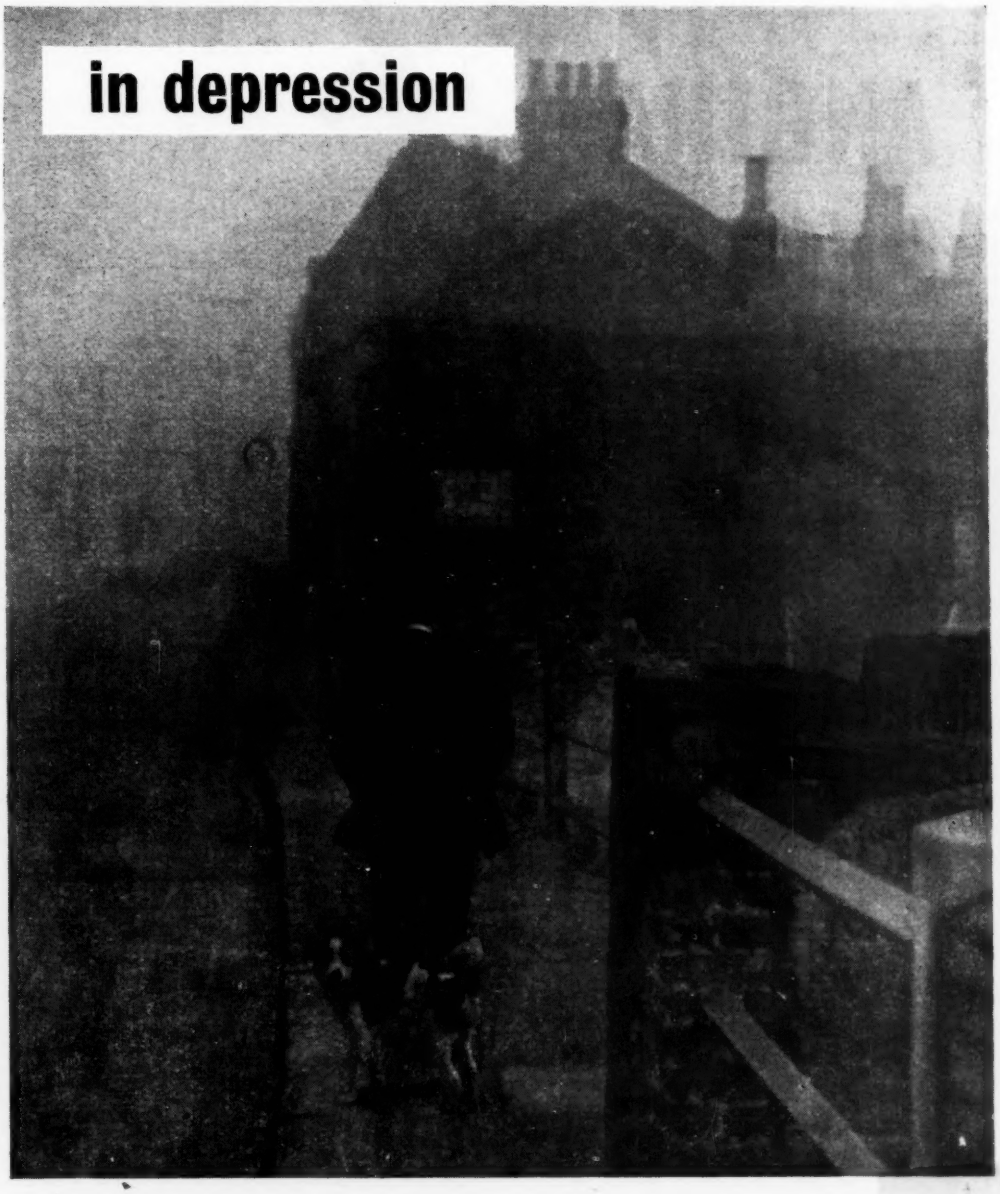

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